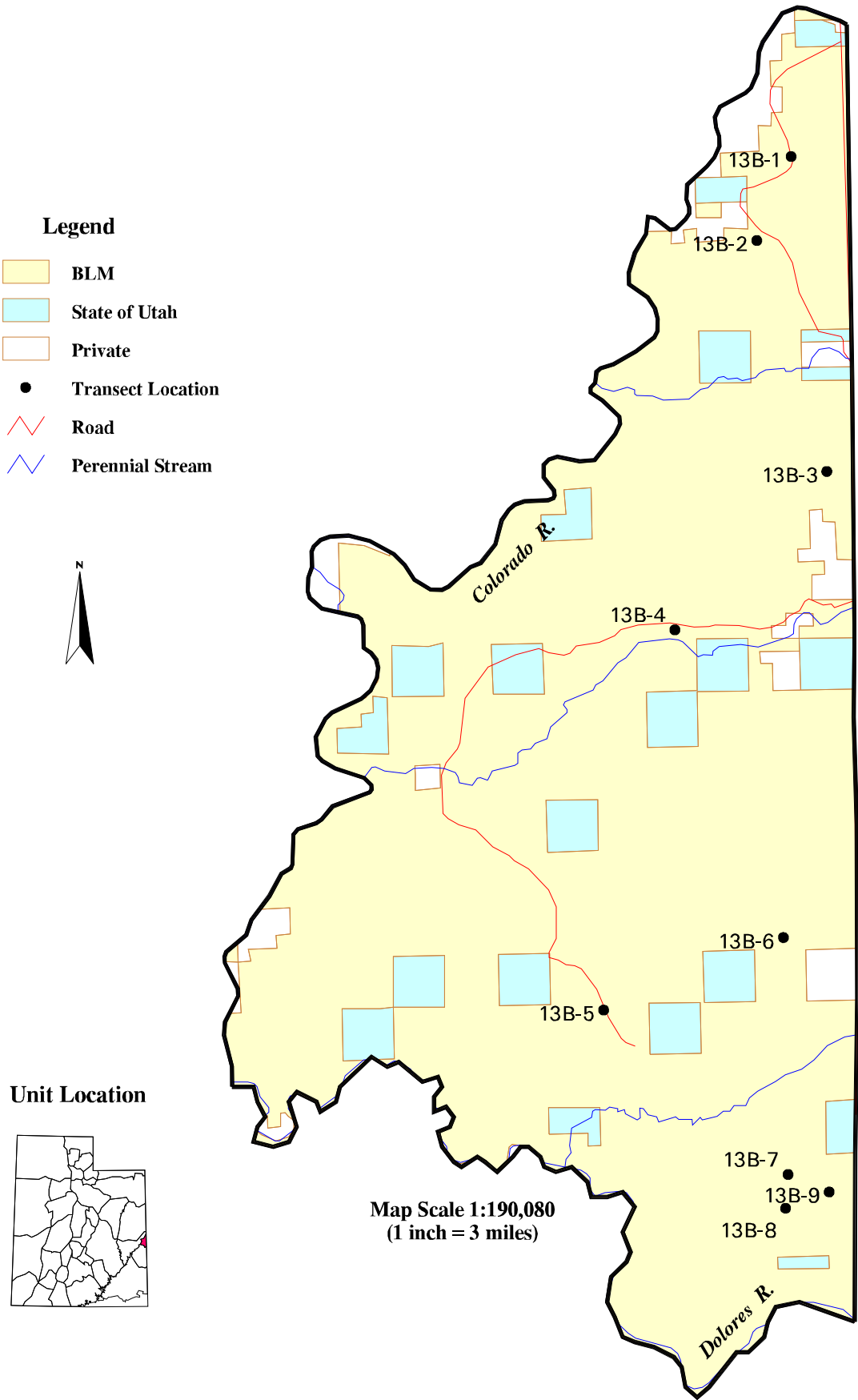


# Management Unit 13B



## WILDLIFE MANAGEMENT UNIT 13B (34)-DOLORES TRIANGLE

### BOUNDARY DESCRIPTION

Grand County - Boundary begins at the Colorado River and Utah-Colorado state line; then southwest along the Colorado River to the Dolores River; east along the Dolores River to the state line; north along the state line to the Colorado River and beginning point.

### Herd Unit Description

The Dolores Triangle unit is formed by the Colorado River, the Dolores River, and the Colorado-Utah state line. Topography is varied with relatively flat mesas above 7,000 feet, large rocky rough canyons and broken country at the middle elevations, with low desert along the Colorado River. Four drainages dominate the area. Granite Creek flows into the Dolores River; Ryan Creek, Coates Creek, and Little Dolores River empty into the Colorado River. There are ranches scattered throughout the area, while Fruita and Grand Junction, Colorado are the closest municipalities. Access to the unit is through Colorado by way of Glade Park or by fording the Dolores River near its confluence with the Colorado River at Dewey. However, fluctuating water levels and undeleted bottom contours make crossing hazardous. The unit is comprised of 94,100 acres of winter range and 17,520 acres are classified as non-range. There isn't any habitat within this unit that would be classified as "real" summer range. The Bureau of Land Management manages 88% (82,900 acres) of the herd unit. The State of Utah owns 9% (8,600 acres) of the winter range and 3% (2,600 acres) is privately owned.

The Dolores Triangle unit serves as winter range for deer which spend the remainder of the year in Colorado's Pinon Mesa area. Few deer reside in the unit year-round, the few that do are found along the Colorado River. Concentration areas for deer during normal winters are Steamboat Mesa, Lower Steamboat Mesa, Fish Park, Big Triangle, Ryan Park, and Granite Park. Only during severe winters with abnormally heavy snowfall are deer forced to disperse into the lower desert range where forage quality is poor. Severe winter range and normal winter range are not separated into different categories because much of the land to the east is too high for normal winter range. Therefore, the whole unit could be considered critical. The many scattered ranches with agricultural land throughout the herd unit offer valuable forage to the deer in the spring and fall.

Coles and Pederson (1968) identified and described five vegetation types which make up the winter range on the unit. The desert shrub type is dominated by blackbrush which occupies the lower portions of this winter range. This type is most important during severe winters although few desirable forage species are found within this type. The grass type is found in the Granite Park and Steamboat Mesa areas. These were once large sagebrush parks, but have undergone a conversion to grasses (much of it cheatgrass) with overgrazing during the wrong time of the year (fall and/or spring), wildfires (reoccurring more often with the increase in weedy species), and sagebrush treatments. Formerly, these areas were important deer wintering areas which now receive increasing use by elk. The sagebrush type is found above the desert shrub and up to and within the pinyon-juniper woodlands. It provides important browse to both deer and livestock. The pinyon-juniper type, like the grass type, has undergone some changes due to competition with the mature trees, extended drought, and with some past years of heavy use. An understory of cliffrose and black sagebrush has diminished somewhat through the years and is the least productive vegetative type on the unit. The pinyon-juniper type is common on the slopes and higher mesas. The pinyon-juniper-sagebrush type occupies the upper portions of the winter range and provides important cover and forage for wildlife. In the past few years many wildfires have burned large acreages of this type.

### Livestock Grazing

Livestock grazing is the single-most important land use in the area. Winter sheep use began in the early 1900's. Now, most of the AUM's (about 7,500) the BLM allocates for livestock use is for cattle, although some winter sheep use still occurs. Pinyon-juniper's evolving dominance along with excessive use by livestock and big game have led to deteriorating range conditions. Both livestock and deer numbers were reduced in the past to help improve the range. Although some problems still exist, range conditions appear to be slowly improving according to Jense et al. 1986. However with mostly drouth conditions since then, those conditions have deteriorated, especially at the lower elevations.

This unit presents some unique deer and elk management problems. Since this unit functions primarily as winter range for big game which spend the remainder of the year in Colorado, any effective management requires coordinated efforts with Colorado's Department of Game and Fish. Also, since deer and elk are present mostly in the winter when snow depth may complicate access to the area, obtaining population data is often difficult. Because the presence of deer and elk depends on weather conditions prior to and during the hunt, hunting as a management tool is not always effective. If heavy snows have driven the deer onto the unit, hunter access is usually a problem. Thus, the number of deer harvested and percent hunter success is often more related to weather conditions than to deer abundance.

### Big Game Trends

Beginning in 1969, the deer herd unit showed a significant drop in bucks harvested. Between 1969 and 1975, either-sex general season and control hunts accounted for an average yearly harvest of 403 bucks and 207 does. Previously, from 1955 through 1968, the buck harvest averaged near 1,500 bucks/year. Under buck only hunting regulations between 1976 and 1985, the average harvest was 89 bucks/year. In 1983, control hunts for does were implemented and have accounted for an average of 122 does/year through 1990. Antlerless permits have not been utilized since 1990. The buck harvest dropped again in 1987 and in 1990 the herd unit was made a draw unit with 26-27 hunters afield and an average of 22 bucks/year harvested through 1995. Current management objectives are a harvest of 100 bucks/year with an antlerless harvest as needed.

Elk that winter in this area come from Colorado's unit 40, which is managed for quality hunting. There have been minimal numbers of elk harvested by Utah hunters in this unit. Basically, Colorado would like to gradually increase these elk numbers from an estimated 1,700 animals now to 3,000 animals sometime in the distant future. About 50% of the elk population use Utah as winter range and are expected to continue to do so. The current management objectives are to maintain an optimum elk herd population, while not degrading the health of the range and hopefully complement Colorado's management goals.

### Trend Study Description

Nine interagency range trend studies were established during June 1986. The study sites were selected the previous month by local interagency personnel. The studies were read again in May of 1995, and 2000.

### Trend Study 13B-1-00

Study site name: Lower Westwater Dolores.

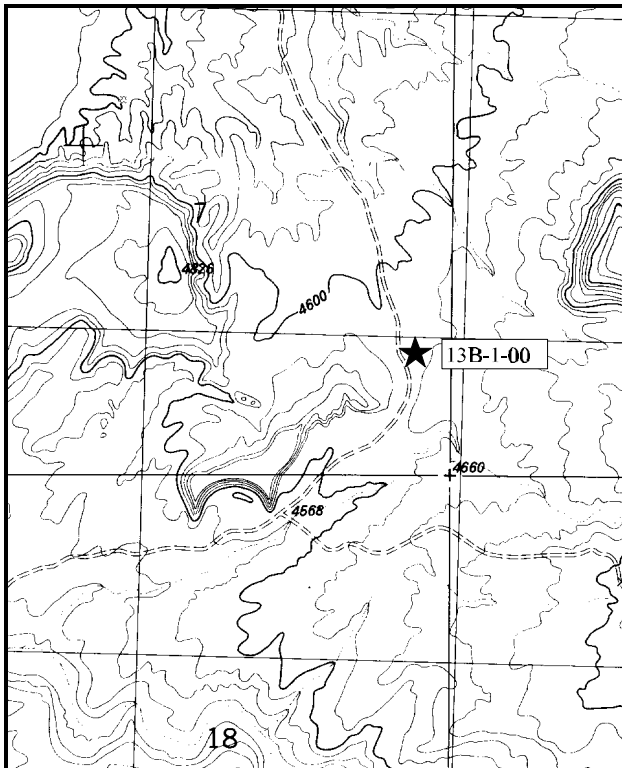
Range type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

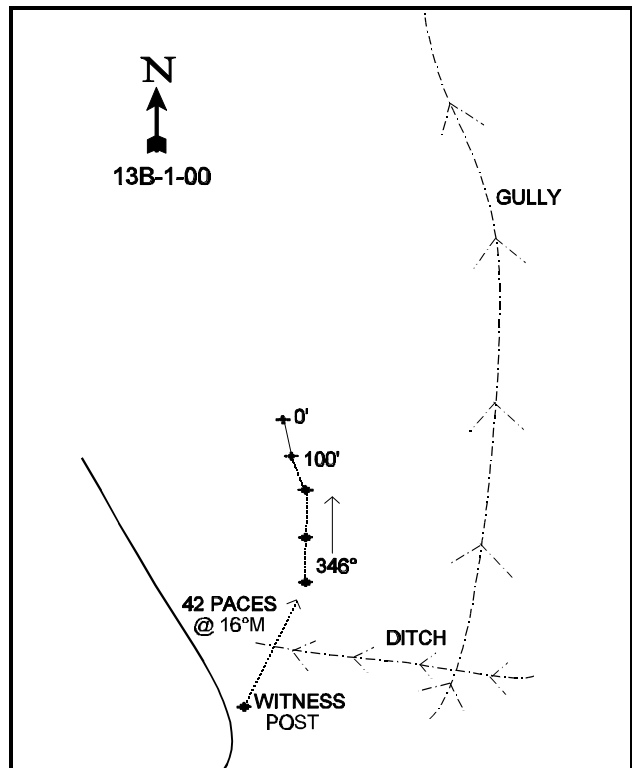
### LOCATION DESCRIPTION

From the intersection of the DS Road and A Road west of Glade Park, Colorado, go down A Road 3.7 miles to the TZ Ranch gate. Turn left and go 1.25 miles along the fence to another gate (permission and key necessary to get through gates). Continue 5.6 miles to the state line. Go another 0.4 miles to a cabin. Turn right along the edge of a field and go 0.2 miles to a wire gate and another .05 to a pipe gate. Go 3.1 miles to transect 13B-2-00 (Upper Westwater Dolores). Continue 0.5 miles to a fork near a sheep corral. Keep right. Continue 1.25 miles to a wire gate, then another 0.85 miles to the witness stake, a 2 ½ foot tall fencepost off the right side of the road on top of the road cut. From the witness post, walk 42 paces at 16°M to the 400-foot baseline stake.



Map Name: Westwater 4SE

Township 20S, Range 26E, Section 7



Diagrammatic Sketch

UTM. 4327183.657 N, 666823.360 E

## DISCUSSION

### Trend Study No. 13B-1 (34-1)

The Lower Westwater-Dolores transect is in a remote area that is basically accessible only through Colorado. The study is in a big sagebrush dominated open valley surrounded by slick rock cliffs and domes of sandstone. It is on a 10% west-facing slope, nearly 2 miles from the Colorado River at an elevation of 4,500 feet. The land is administered by the BLM out of the Grand Junction office in Colorado. The allotment is grazed by cattle and horses from November through May. This is a poor time to graze the area with respect to wildlife, when forage they are depending on is cheatgrass which makes up over 80% of the grass cover and has to have fall precipitation to germinate which it did not get in 1999. Deer pellet group quadrat frequency was moderate at 31% in 1995 and 39% in 2000. The pellet-group transect read in 2000 showed 79 deer days use/acre (195 ddu/ha), 12 elk days use/acre (30 edu/ha), and 27 cow days use/acre (67 cdu/ha).

The soil is protected fairly well by the combination of vegetation and litter. Litter was moderately abundant in 1995, mostly coming from annuals, with a cover value estimated at 51%. With drought, litter has now gone down to 35%. The vegetation and litter provide fairly good cover for the soil with no currently apparent erosion problems. However, pedestalling around the sagebrush is about 5 to 7 inches. Soil is deep with an average effective rooting depth of 19 inches. There is a compacted layer of fine sands and clay at about 6 inches, which becomes less compacted beyond 14 inches. Almost without exception, the shrub interspaces had more shallow effective rooting depths than near the base of the shrubs. The soil is classified as a sandy loam and moderately alkaline (8.2 pH). Soil temperature was moderately high at 64° F, which would favor the annuals during dry summers. Phosphorus could be limiting with a value of only 3.9ppm, where 10ppm is thought minimal for normal plant growth and development. The soil has a fine texture on the surface, but is composed mostly of sand. No rock or pavement was encountered on the surface or in the profile.

The key browse species on this site is basin big sagebrush with some apparent hybrids with Wyoming big sagebrush. This stand exhibits a distinctly clumped dispersion pattern with a dense understory of annual species. Some sagebrush display a clubbed appearance and have more character traits of Wyoming sagebrush, while others not clubbed and obviously not as preferred, have more traits of basin big sagebrush. The population structure has greatly changed since the last readings. In 1986, 88% of the population were young plants and no mature plants were reported. In 1995, only 1% of the population were young while 66% were mature. Currently ('00) it is just below 2%, still too low to maintain the population. Percent decadency has increased from 12% in 1986 to 32% in 1995, and 53% in 2000 with no seedlings reported for any year. It is very difficult to get seedlings established with the intense competition from the annual grasses and forbs. Basically there are no safe sites for them to become established, especially with the moderately high soil temperatures which will dry the soils out quickly in the summer. In 1995, 79% of the decadent population was classified as dying and the number of dead plants in the population (1,920 plants/acre) numbers more than the living. Currently, the number of decadent plants classified as dying has gone down slightly to 48%, however there are still more dead than live plants. Twenty-six percent of the population are classified as having poor vigor in 1995 and 2000. Cover from the Wyoming big sagebrush contributed only 8% of the total vegetative cover in 1995 and 12% in 2000. Mature plants in 1995 averaged 24 inches in height with a crown of 30 inches, now both of these measurements have decreased significantly to an average height and crown of 19 and 26 inches respectively. This is another indication of what extended drought does to sagebrush. Measurements of height and crown were not taken in 1986 because there were no mature plants reported at that time.

Other browse species include broom snakeweed and spiny hopsage which are in very low densities. Green ephedra was present in low numbers and heavily hedged in 1986 and appeared to be dying off. None were sampled in 1995. On the opposing slope, there is a vigorous stand of sand sagebrush, a few decadent spiny hopsage and a few scattered juniper.

In 1995, annual species (both grasses and forbs) contributed to 76% of the total vegetative cover on this site. Cheatgrass alone provided 61% of the total vegetative cover and 86% of the total grass cover. This changed little with the 2000 reading. There are very few perennial herbaceous species present which contribute to only a small percent of the herbaceous cover (17% for both 1995 and 2000). The most abundant perennial grass, galleta (a warm season grass) has significantly declined in nested frequency since 1988 and now only provides 12% of the total grass cover. Forbs accounted for 21% of the vegetative cover in 1995 with most being small annual species. Now the forbs account for only 11% of the vegetative cover, and again most are small annual species.

#### 1986 APPARENT TREND ASSESSMENT

The soil trend is stable, although there is signs of some soil movement when the litter and/or cryptogam cover is disturbed. The vegetative condition and trend is somewhat puzzling. There appears to have been a sagebrush die-off in recent years. This was not because of grazing pressure because of only light to moderate use in the past. It was probably more of a response to the excessively wet years of 1983-85. Basin big sagebrush naturally experiences a fairly rapid turnover in generations, and it seems to be occurring on this site at the present time. There appears to be a sufficient proportion of young plants to maintain shrub density at an acceptable level. Trend therefore appears to be stable.

#### 1995 TREND ASSESSMENT

Due to abundant protective ground cover, decrease in percent bare ground, and no apparent erosion problems, soil trend is considered stable. Although, most of the soil cover comes from annual species and litter. Although the abundant cover of annuals helps to protect the soil, it is very detrimental to the health of the community to have such a high amount of fine fuels present. It is just a matter of time before a fire will totally destroy the sagebrush population in the immediate area. Due to the poor age class structure, large numbers of dead plants and high decadence which has almost tripled to 36% since 1986, trend for the key browse species is down. To further aggravate this situation, 79% of the decadent plants are classified as dying. The lack of seedlings in the area is a function of extended drought conditions as well as intense competition with the winter annuals even when there could have been adequate precipitation for establishment. Herbaceous understory, while it does provide ground cover, has the potential to carry a very destructive fire. Therefore, the herbaceous understory trend is down.

##### TREND ASSESSMENT

soil - stable (3)

browse - down (1)

herbaceous understory - down (1) because it is mostly annuals

#### 2000 TREND ASSESSMENT

With continued drought, there has been a significant drop in protective ground cover from 51% to 35%. This decrease has been mitigated somewhat by the increase of cryptogamic cover from 2 to 12%. However, the percent bare soil has increased from 18% to almost 39%. There still does not appear to be any apparent erosion problems, but soil trend would have to be slightly down with the current changes in protective cover and that most of the protective cover comes from annual species and litter. Although the abundant cover of annuals helps to protect the soil, it is very detrimental to the health of the community to have such a high amount of fine fuels present. It is just a matter of time before a fire will totally destroy the sagebrush population in the immediate area. Due to the poor age class structure, large numbers of dead plants and high decadence which has continued to increase (12% in 1986, 32% in 1995, and 53% in 2000), trend for the key browse species continues to be down. To further worsen this situation, percentage of decadent plants that are classified as

dying continues to be high at almost 50%. The lack of seedling establishment in the area was mentioned in 1995. This is a function of extended drought conditions as well as intense competition with the winter annuals even when normal precipitation occurs. The moderately high soil temperatures favors annuals, particularly winter annuals. Herbaceous understory, while it does provide ground cover, has the potential to carry a very destructive fire. Therefore, the herbaceous understory trend is down.

#### TREND ASSESSMENT

soil - slightly down (2)

browse - down (1)

herbaceous understory - down (1) because it is mostly annuals

#### HERBACEOUS TRENDS --

Herd unit 13B, Study no: 1

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
G	Bromus tectorum (a)	-	<sub>b</sub> 384	<sub>a</sub> 334	-	100	97	12.39	12.20
G	Hilaria jamesii	<sub>c</sub> 206	<sub>b</sub> 114	<sub>a</sub> 75	71	41	33	1.99	1.83
G	Oryzopsis hymenoides	-	-	1	-	-	1	-	.15
G	Sitanion hystrix	9	-	-	4	-	-	-	-
G	Sporobolus cryptandrus	<sub>a</sub> 1	<sub>a</sub> -	<sub>b</sub> 23	1	-	10	-	.77
G	Vulpia octoflora (a)	-	46	48	-	18	25	.09	.27
Total for Annual Grasses		0	430	382	0	118	122	12.48	12.47
Total for Perennial Grasses		216	114	99	76	41	44	1.99	2.75
Total for Grasses		216	544	481	76	159	166	14.47	15.23
F	Astragalus spp.	<sub>b</sub> 12	<sub>ab</sub> 4	<sub>a</sub> -	5	2	-	.01	-
F	Chenopodium fremontii (a)	-	<sub>a</sub> -	<sub>b</sub> 39	-	-	19	-	.14
F	Chaenactis stevioides	-	3	-	-	1	-	.00	-
F	Cryptantha spp.	<sub>a</sub> -	<sub>b</sub> 12	<sub>a</sub> -	-	7	-	.03	-
F	Draba nemorosa (a)	-	<sub>a</sub> 3	<sub>b</sub> 14	-	1	7	.00	.03
F	Erodium cicutarium (a)	-	<sub>a</sub> 35	<sub>b</sub> 75	-	12	27	.45	1.25
F	Lappula occidentalis (a)	-	1	6	-	1	4	.00	.04
F	Lepidium densiflorum (a)	-	120	25	-	47	16	.79	.18
F	Leucelene ericoides	<sub>ab</sub> 26	<sub>c</sub> 56	<sub>a</sub> 15	11	28	7	1.12	.13
F	Machaeranthera canescens	-	-	1	-	-	1	-	.00
F	Navarretia intertexta (a)	-	<sub>b</sub> 61	<sub>a</sub> 18	-	25	9	.13	.07
F	Oenothera albicaulis (a)	-	<sub>b</sub> 9	<sub>a</sub> -	-	4	-	.02	-
F	Plantago patagonica (a)	-	<sub>b</sub> 191	<sub>a</sub> 10	-	67	7	.61	.06
F	Sisymbrium altissimum (a)	-	<sub>b</sub> 156	<sub>a</sub> 24	-	68	15	.93	.24
F	Sphaeralcea parvifolia	-	7	5	-	5	2	.02	.01

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
	Total for Annual Forbs	0	576	211	0	225	104	2.95	2.05
	Total for Perennial Forbs	38	82	21	16	43	10	1.20	0.14
	Total for Forbs	38	658	232	16	268	114	4.16	2.20

Values with different subscript letters are significantly different at  $\alpha = 0.10$  (annuals excluded)

#### BROWSE TRENDS --

Herd unit 13B, Study no: 1

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata tridentata	41	29	1.69	2.39
B	Gutierrezia sarothrae	2	1	-	-
	Total for Browse	43	30	1.69	2.39

#### BASIC COVER --

Herd unit 13B, Study no: 1

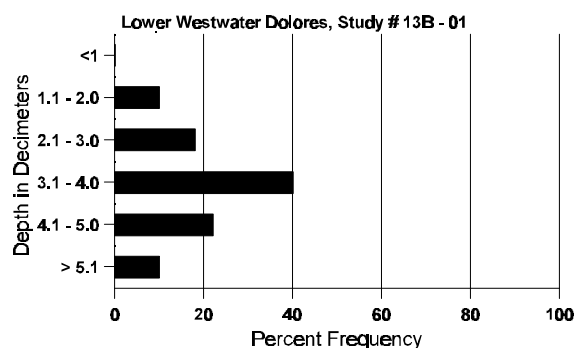
Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'86	'95	'00
Vegetation	395	353	11.50	29.78	22.89
Rock	-	-	0	0	0
Pavement	-	-	.25	0	0
Litter	399	366	50.50	51.34	34.70
Cryptogams	150	264	18.50	2.17	12.19
Bare Ground	285	335	19.25	17.96	38.54

#### SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 1, Study Name: Lower Westwater Dolores

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
18.98	63.8 (18.11)	8.2	71.0	16.4	12.6	0.0	3.9	118.4	0.1

## Stoniness Index



### PELLET GROUP FREQUENCY --

Herd unit 13B, Study no: 1

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	00	00
Rabbit	12	10	-	N/A
Elk	-	-	157	12 (30)
Deer	31	39	1027	79 (195)
Cattle	3	4	183	27 (68)

### BROWSE CHARACTERISTICS --

Herd unit 13B, Study no: 1

A G R E		Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
			1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata tridentata																			
Y	86		25	40	1	-	-	-	2	-	-	65	3	-	-	4533		68	
	95		1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00		-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
M	86		-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95		43	6	-	-	-	-	-	-	-	49	-	-	-	980	24	49	
	00		7	11	9	-	1	-	-	-	-	28	-	-	-	560	19	28	
D	86		-	1	3	-	5	-	-	-	-	8	1	-	-	600		9	
	95		17	5	2	-	-	-	-	-	-	5	-	-	19	480		24	
	00		3	15	6	2	5	-	2	-	-	17	-	-	16	660		33	
X	86		-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95		-	-	-	-	-	-	-	-	-	-	-	-	-	1920		96	
	00		-	-	-	-	-	-	-	-	-	-	-	-	-	1640		82	
% Plants Showing			<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86			60%			05%			00%										
'95			15%			03%			26%			-21%							
'00			52%			24%			26%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	5133	Dec:	12%				
												'95	1480		32%				
												'00	1240		53%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Grayia spinosa																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	17	26	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'86	0	Dec:	-	
														'95	0		-	
														'00	0		-	
Gutierrezia sarothrae																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	-	1	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	-	1	-	-	20	12	12	1
	00	1	-	-	-	-	-	-	-	-	-	1	-	-	20	5	-	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%			-50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'86	0	Dec:	-	
														'95	40		-	
														'00	20		-	
Opuntia spp.																		
M	86	1	-	-	-	-	-	-	-	-	-	-	1	-	66	6	7	1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'86	66	Dec:	-	
														'95	0		-	
														'00	0		-	

### Trend Study 13B-2-00

Study site name: Upper Westwater-Dolores .

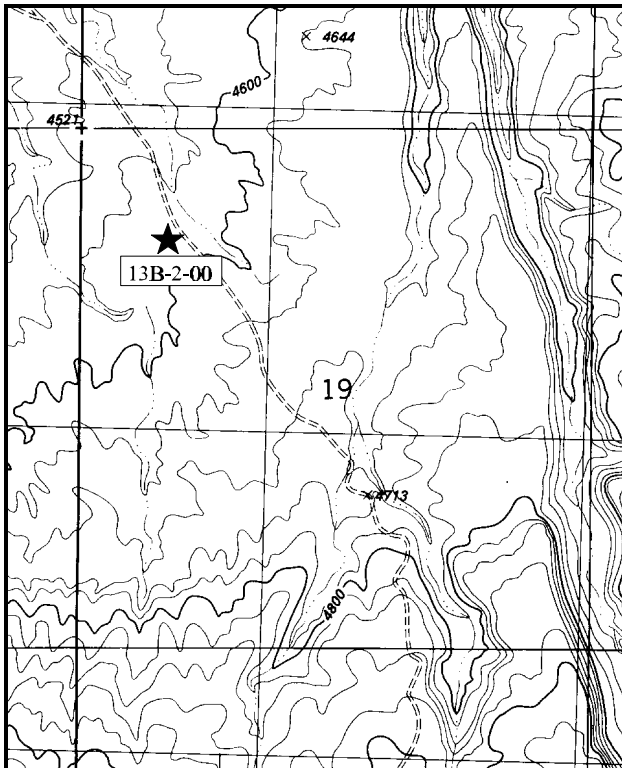
Range type: Burn .

Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

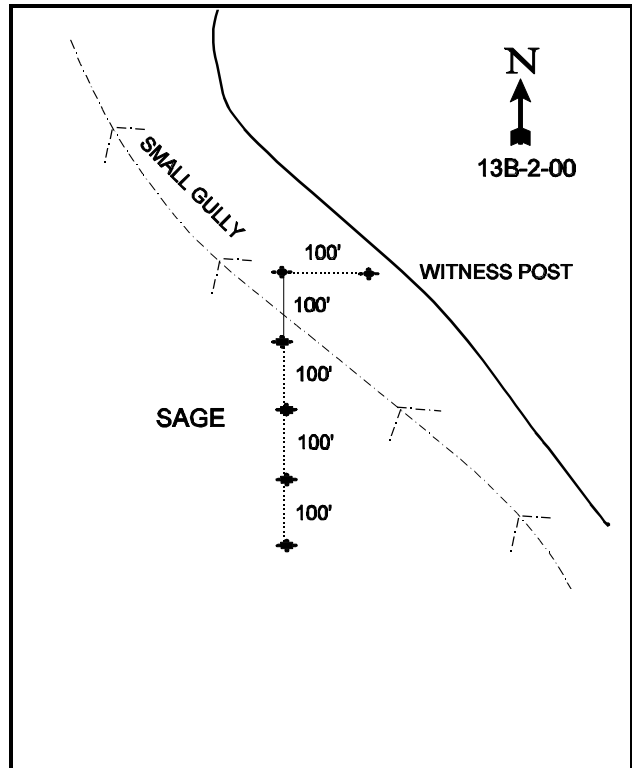
### LOCATION DESCRIPTION

From the intersection of the DS Road and A Road west of Glade Park, Colorado, go down A Road 3.7 miles to the TZ Ranch gate. Turn left and go 1.25 miles to a locked gate (necessary to obtain permission and key). Continue 5.6 miles through the valley to the state line. Proceed 0.4 miles to a cabin, turn right and go along the edge of a field 0.2 miles to a wire gate. Go 0.05 miles to a locked pipe gate, and then 3.1 miles on the main road to the transect. There is a witness post (rebar) off the left side of the road 10-15 feet. The 0-foot baseline stake, a rebar tagged #7957, is 100 feet due west of the witness post.



Map Name: Westwater 4SE

Township 20S , Range 26E , Section 19



Diagrammatic Sketch

UTM. 4324545.753 N, 665745.123 E

## DISCUSSION

### Trend Study No. 13B-2 (34-2)

Like study no. 13B-1, the Upper Westwater study is in the northeast portion of the Dolores Triangle. It samples a big sagebrush flat surrounded by juniper woodland and nearby sandstone cliffs. The Colorado River is approximately 2 miles to the west. The site is at 4,600 feet with a 3-5% slope and a northwest exposure. The area is grazed by cattle in winter and early spring (2,791 AUM's are presently allocated on the allotment). The number of deer pellet groups found at the site are low in number and scattered. Since 1986, the site has burned leaving only a few scattered sagebrush stumps and no living sagebrush plants. The pellet-group transect in 2000 estimated 8 deer days use/acre (20 ddu/ha) (winter use) and 51 cow days use/acre (126 cdu/ha) (winter and spring use). This appears to be excessive livestock use for a burned, depleted area that is made up of almost totally annual, weedy species (96-99% of the total vegetative cover is made up of annual weeds).

The soil is a reddish, sandy loam, which appears to be moderately deep. It is a sandy loam with a neutral pH (7.2). Effective rooting depth is a little more than 14 inches with a moderately high soil temperature (66° F). Phosphorus could be a limiting factor at 8.4 ppm, where 10 is thought necessary for normal plant development and growth. Litter cover was fairly abundant (59%) in 1995, but was essentially contributed by only annual species. This kind of cover characteristically can be lost with drought, as illustrated by the fact that with a very dry winter and summer of 1999-2000, litter cover is now only about half what it was before (59% vs 36%). There was a low amount of bare soil (14%) in 1995, due to the high amounts of cover from litter and annual vegetation. However, now ('00) bare soil has more than doubled to 29%. No rock and very little pavement was sampled. Cryptogamic crust development is evident. It only contributed to 3% cover in 1995, increasing to almost 17% in 2000.

In the past, basin big sagebrush was the dominate browse species with an estimated density of 2,199 plants/acre. Sometime after the 1986 reading the sagebrush population was lost to a wildfire with annual species now dominating the site. The fire appears to have burned very hot with the fine fuels provided by annual species leaving very little sign that sagebrush once dominated the site. There is no indication that the sagebrush population is going to return in the future. Other associated browse species (four-wing saltbush and spiny hopsage) are also gone with no signs of becoming reestablished at this time. Around the periphery of the site, there are still some juniper trees that were singed by the fire, but appear to be recovering.

Annual cheatgrass dominated the understory in 1986. Although dense that year, the cheatgrass appeared to be affected by a fungus that in many areas of the state had greatly reduced seed production during the wet years of 1983-85. Since the destructive wildfire, annual plant species account for as much as 96-99% of the total vegetative cover on the site. Grasses provide 70% of the vegetative cover, with forbs providing the remaining 30%. In 1995, the dominate grass was cheatgrass, which accounted for 57% of the total vegetative cover and sixweeks fescue, also present, contributing 11% vegetative cover. These two grasses combined account for two-thirds of the total vegetative cover and provide great quantities of fine fuel. Galleta and purple threeawn are present but in very low numbers. Tumblemustard and woolly Indian wheat are the predominant forbs on the site and also contribute to the high fuel loads of the site. Currently ('00), because of the dry fall and winter, much of the cheatgrass did not germinate. It has dropped in aerial cover from 16% in 1995 to less than 1% in 2000.

### 1986 APPARENT TREND ASSESSMENT

Vegetative trend appears stable. The basin big sagebrush is healthy and it has adequate reproduction. An increase in species diversity for shrubs would be desirable to supplement the sagebrush. However, a more palatable species would be severely hedged even though browsing pressure is low on this site. The juniper appear to be increasing, but are not in densities that would form a closed canopy. There is little sign of erosion

and the soil trend appears stable although an increase in perennial grass species would provide needed diversity and a more reliable ground cover than annual cheatgrass. The high amount of annuals makes this community very susceptible to fire and loss of the all the browse component.

#### 1995 TREND ASSESSMENT

Annual vegetation and litter provide ample cover to the soil. Although the soil is protected, they also provide abundant fine fuel to carry another destructive fire. Therefore, soil trend is stable but with poor cover composition. The recent fire removed all browse species from the area and there are apparently no seedlings at this time. The browse trend is down. Deer will likely use this area in the spring when the plants are succulent, but can no longer rely on the area as a source for browse species in moderate or severe winters. The herbaceous understory trend is down because of the poor composition. Perennial species diversity and abundance need to increase for the site to stabilize which will mitigate the effects of future wildfires.

##### TREND ASSESSMENT

soil - stable (3)

browse - down (1), loss of browse to wildfire

herbaceous understory - down (1), mostly composed of annual species

#### 2000 TREND ASSESSMENT

Annual vegetation and litter still provide fair cover for the soil. Although the soil has some protection, the annual species also provide abundant fine fuel to carry another fire. The amount of bare soil has increased (from 14% to 29%) with significantly lower vegetation and litter cover values. Therefore, soil trend is down because of the continued dominance of annual species and much higher amounts of bare soil. There are still no signs of any kind of browse reproduction on this site which is not surprising in light of the severe competition for soil moisture from the dominance of annual species and the moderately high soil temperatures which is very disadvantageous to the sagebrush seedlings to ever become established through the summer. It would be safe to say that we will not see sagebrush reestablished here in our lifetime. The browse trend is obviously down. Deer will likely use this area in the spring when the plants are succulent, but can no longer rely on the area as a source for browse species in moderate or severe winters. The herbaceous understory trend is down because of the poor cover composition. Perennial species diversity and abundance need to increase for the site to stabilize which could mitigate the effects of future wildfires.

##### TREND ASSESSMENT

soil - down (1)

browse - down (1), loss of browse to wildfire

herbaceous understory - down (1), mostly composed of annual species

HERBACEOUS TRENDS --

Herd unit 13B, Study no: 2

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
G	Aristida purpurea	a <sup>-</sup>	a <sup>2</sup>	b <sup>6</sup>	-	1	3	.03	.21
G	Bromus tectorum (a)	-	b <sup>371</sup>	a <sup>187</sup>	-	99	68	16.27	.89
G	Hilaria jamesii	45	40	33	16	14	14	.65	.95
G	Sporobolus cryptandrus	a <sup>-</sup>	a <sup>-</sup>	b <sup>15</sup>	-	-	8	-	.93
G	Vulpia octoflora (a)	-	a <sup>277</sup>	b <sup>326</sup>	-	89	96	3.01	5.39
Total for Annual Grasses		0	648	513	0	188	164	19.29	6.29
Total for Perennial Grasses		45	42	54	16	15	25	0.69	2.09
Total for Grasses		45	690	567	16	203	189	19.98	8.38
F	Astragalus spp.	a <sup>-</sup>	b <sup>15</sup>	a <sup>-</sup>	-	6	-	.08	-
F	Calochortus nuttallii	-	3	-	-	1	-	.00	-
F	Chenopodium fremontii (a)	-	a <sup>-</sup>	b <sup>12</sup>	-	-	7	-	.03
F	Cryptantha spp.	-	1	-	-	1	-	.00	-
F	Draba spp. (a)	-	a <sup>-</sup>	b <sup>24</sup>	-	-	8	-	.04
F	Eriogonum cernuum (a)	-	2	-	-	1	-	.00	-
F	Erodium cicutarium (a)	-	a <sup>44</sup>	b <sup>213</sup>	-	19	64	.14	9.74
F	Erigeron spp.	-	2	-	-	1	-	.00	-
F	Lepidium densiflorum (a)	-	b <sup>70</sup>	a <sup>10</sup>	-	31	5	.15	.05
F	Machaeranthera spp	a <sup>-</sup>	b <sup>6</sup>	a <sup>-</sup>	-	3	-	.01	-
F	Navarretia intertexta (a)	-	b <sup>51</sup>	a <sup>11</sup>	-	26	5	.15	.02
F	Plantago patagonica (a)	-	b <sup>276</sup>	a <sup>6</sup>	-	89	3	1.93	.01
F	Salsola iberica (a)	-	a <sup>-</sup>	b <sup>10</sup>	-	-	4	-	.02
F	Sisymbrium altissimum (a)	-	b <sup>307</sup>	a <sup>241</sup>	-	98	87	5.85	3.69
F	Sphaeralcea coccinea	a <sup>2</sup>	c <sup>54</sup>	b <sup>25</sup>	1	25	12	.27	.72
Total for Annual Forbs		0	750	527	0	264	183	8.25	13.62
Total for Perennial Forbs		2	81	25	1	37	12	0.38	0.72
Total for Forbs		2	831	552	1	301	195	8.63	14.35

Values with different subscript letters are significantly different at % = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 13B, Study no: 2

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Gutierrezia sarothrae	0	1	-	.03
Total for Browse		0	1	0	0.03

BASIC COVER --

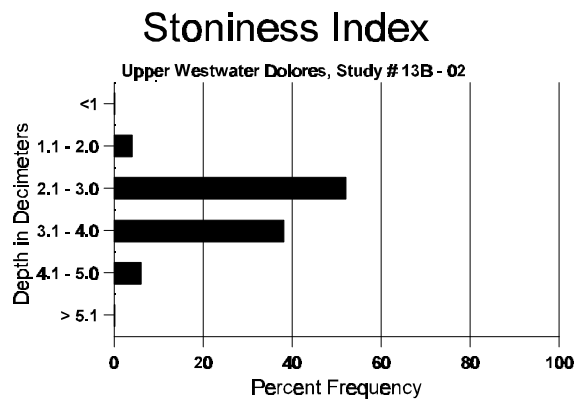
Herd unit 13B, Study no: 2

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'86	'95	'00
Vegetation	393	371	10.50	47.54	26.79
Rock	3	3	0	.00	.00
Pavement	-	9	0	0	.01
Litter	399	370	69.50	59.21	36.02
Cryptogams	195	272	3.50	3.03	16.78
Bare Ground	293	355	16.50	13.90	29.22

SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 2, Study Name: Upper Westwater Dolores

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
14.44	65.6 (17.87)	7.2	56.0	26.0	18.0	0.4	8.4	163.2	0.5



PELLET GROUP FREQUENCY --

Herd unit 13B, Study no: 2

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	9	2	-	-
Deer	10	9	104	8 (20)
Cattle	9	25	609	51 (126)

## BROWSE CHARACTERISTICS --

Herd unit 13B, Study no: 2

Artemisia tridentata tridentata																		
YGR E	YR	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Y	86	10	-	-	-	-	-	-	-	-	10	-	-	-	666			10
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	6	-	-	-	-	-	-	-	-	6	-	-	-	400	28	27	6
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	86	17	-	-	-	-	-	-	-	-	17	-	-	-	1133			17
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	2199	Dec:	52%			
												'95	0		0%			
												'00	0		0%			
Gutierrezia sarothrae																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	12	0
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			100%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	0%			
												'95	0		0%			
												'00	20		100%			

### Trend Study 13B-3-00

Study site name: Fish Park .

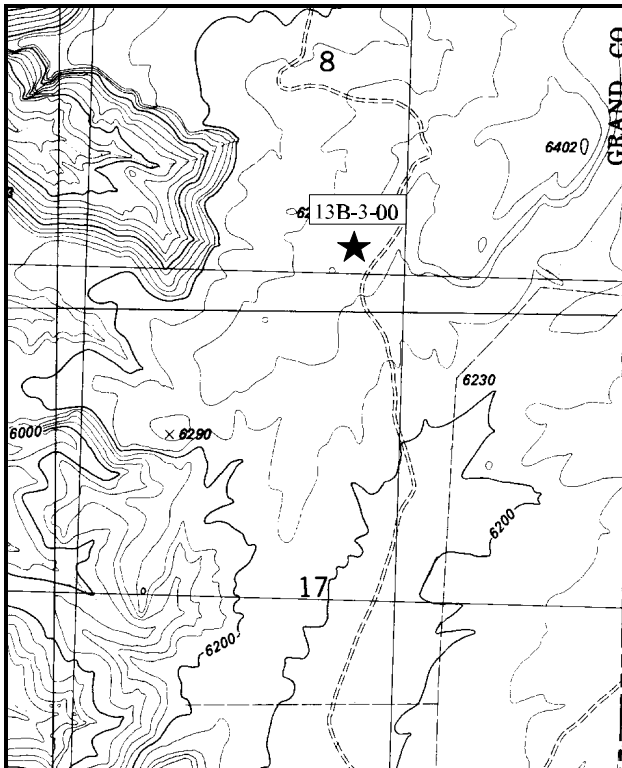
Range type: Chained, Seeded P-J .

Compass bearing: frequency baseline 255°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

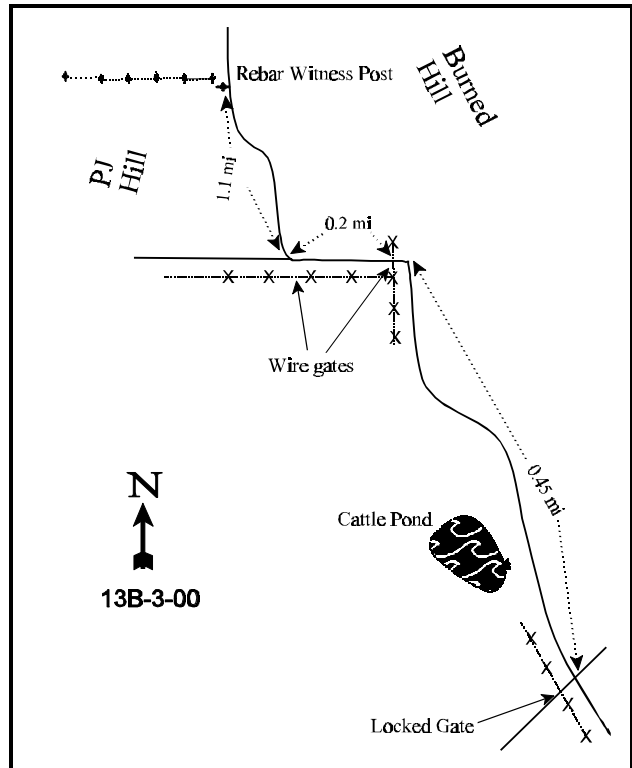
### LOCATION DESCRIPTION

Starting from the turnoff to the Picture Gallery Ranch (approximately 0.75 miles west of the Utah-Colorado state line out of Glade Park, CO), turn right off the main road and drive 0.1 mile to a fork. Take the right (upper) fork, go 1.2 miles to a ranch. Just past the first house, turn right and proceed northeast towards a hill. You are heading basically north-northwest towards the Juniper-covered hills. At 0.6 miles beyond the house, go through a gate and continue north 0.4 miles to another gate. Call Bell Chesnick at (970) 245-4636 to open this gate. After going through the locked gate turn left and go 4.5 miles to another wire gate. Go through the wire gate and continue 0.2 miles. Turn right onto a faint road that has been seeded over. This turn is opposite a gate in the fence. Continue 1.1 miles gradually climbing the hill. The road becomes very rocky toward the top. Pass a fencepost which is not the witness post. Once in the P-J look for a rebar witness post on the left side of the road. The 0-foot baseline stake, a rebar tagged #7874, is 150 feet west of the witness post.



Map Name: Marble Canyon

Township 21S , Range 26E , Section 8



Diagrammatic Sketch

UTM 4317290 N, 667945.851 E

## DISCUSSION

### Trend Study No. 13B-3 (34-3)

The Fish Park study is at an elevation of 6,300 feet on the upper, eastern edge of a 2,600 acre BLM chaining and seeding completed in 1968. To the south and east are the pastures and fields in Fish Park. The gentle west-sloping country is cut by intermittent canyons which flow directly into the Colorado River. To accommodate the increased sample size and stay within the same vegetative type, the transect had to be repositioned. The chaining is part of the Fish Park allotment, which is administered by the Grand Junction BLM office. Livestock grazing pressure appears moderately light in the study area. Deer pellet groups were rarely encountered. This coincides with the nearby pellet group trend transect located in Fish Park at an elevation of 6,200 feet. It estimated an average of 11 deer days use/acre (27 ddu/ha) from 1985 through 1995. The average for the whole herd unit is 15 deer days use/acre (37 ddu/ha) for the same period. A pellet-group transect read along the study site baseline in 2000 estimated 14 deer days use/acre (6 ddu/ha), less than 1 elk days use/acre (<1 edu/ha), and 3 cow days use/acre (1 cdu/ha). Rabbit pellet group quadrat frequency was quite high in 1995, which could account for much of the utilization. Currently quadrat frequency less than half what it was then.

The soil is a loam with a neutral soil reaction (pH of 6.8). Effective rooting depth is almost 16 inches over a bedrock of sandstone. The soil surface contains very few rocks or pavement, although there are large amounts of rock throughout the profile to about 16 inches. Both phosphorus and potassium are low (5.9 ppm and 61 ppm) and could be a limiting factor where 10 ppm of phosphorus and 70 ppm of potassium are considered minimal for normal plant development and growth. There is good vegetative cover on this site with some scattered bare interspaces between clumps of basin big sagebrush and pinyon-juniper trees. In the bare interspaces, erosion doesn't appear to be a problem. Annual plants and slight erosion can be found near the roadside where the soil has been disturbed.

The size of the pinyon-juniper trees have noticeably increased since 1986 as evidenced by comparing photographs from each year. The point-center quarter method estimated 73 juniper and 13 pinyon trees/acre in 2000. These densities are moderately low for a 27 year old chaining and very similar to the readings done in 1995. Much of the herbaceous understory on this site appears to be around the drip line of the mature trees.

Basin big sagebrush is the key browse species on this chained site. Browse seed was provided by the Division, which included big sagebrush and four-wing saltbush. However, which sagebrush subspecies included in the seed mix is not clear because both *Artemisia tridentata tridentata* and *Artemisia tridentata wyomingensis* are present on the site. Basin big sagebrush appears dominant, therefore the data tables refers to all sagebrush as basin big sagebrush. In general, the sagebrush is lightly hedged, and vigorous with good seed production. The age structure has shifted from a young population to a more mature population. Sixty three percent of the plants were classified as mature in 1995, compared to only 24% in 1986. Currently ('00) it is up to 75%. The percentage of plants classified as decadent decreased in 1995, but has since increased slightly up to 9%. This is still very low compared to any other site in this unit. The percentage of seedlings in the population has varied from highs in the low 40's to currently where it is almost 20% which is still relatively high. In 1995, average height of sagebrush had increased to nearly two and one half feet with crown measurements averaging three and one-half feet. By 2000, these measurements have decreased slightly with the continued drought. Broom snakeweed and cactus are present, and shown to have increased slightly yet these populations together make up less than 1% total cover.

The sum of nested frequency for perennial grasses has decreased from 1986 to 1995, however it increased slightly in 2000. Crested wheatgrass and galleta were the dominate perennial grasses in 1995 which made up 50% of the total grass cover in 1995. The decrease in crested wheatgrass is most likely due to summer drought. The annual species, cheatgrass and sixweeks fescue, account for nearly all of the rest of the grass cover. With

the dry fall of 1999 and the dry winter and summer of 2000, cheatgrass did not do well, neither did sixweeks fescue. Their cover decreased by more than 80% in 2000.

Forbs occur infrequently and account for only a small amount of the total vegetative cover (6% to 5%). Alfalfa was reported as large and vigorous in 1986, yet with the extended drought, it was not sampled in 1995 or 2000. Other forbs sampled include: timber milkvetch, longleaf phlox, scarlet globemallow, and woolly milkvetch. Nested frequency for all grasses and forbs increased since 1986, but this is due to annual species that were present in 1986, but not included in the data. In 2000 these values decreased, mostly because of the loss of many annuals with the dry winter and summer. Sum of nested frequency for perennial herbaceous life-forms increased slightly for grasses and slightly down for forbs. Overall it appears to be stable.

#### 1986 APPARENT TREND ASSESSMENT

The area is currently in good condition. All signs indicate it will stay that way except for the possible gradual increase in juniper and pinyon. Selective hedging on the more palatable big sagebrush subspecies, Wyoming big sagebrush, may affect its reproductive potential. The pinyon and juniper are not dense enough to warrant chaining, but other treatments such as selective application of herbicides, roller-chopping, or individual tree cutting could be practical alternatives. The entire chaining is in similar condition and treatment should be considered within the next 20 years. The soil appears stable because of good vegetation and litter cover.

#### 1995 TREND ASSESSMENT

Vegetative cover and litter cover are moderately high with each having high nested frequency values indicating good distribution of protective cover, which appears to provide adequate soil protection. In areas where bare interspaces appear, there are no signs of erosion, therefore soil trend is considered stable. The sagebrush community has shifted to a more mature population with good biotic potential and a decreased percentage of decadent plants. These combined factors indicate an upward browse trend. If the sagebrush population continues to expand it will begin to significantly affect herbaceous understory when cover starts to exceed 15%. Sum of nested frequency of perennial grasses has decreased with nearly half of the grass cover coming from annuals. Forbs are infrequent and add very little to the herbaceous understory. This leads to a slightly downward herbaceous understory trend. The decrease in perennials is likely due to the extended drought as well as competition with annuals and browse species.

##### TREND ASSESSMENT

soil - stable (3)

browse - upward (5)

herbaceous understory - slightly down (2)

#### 2000 TREND ASSESSMENT

Vegetative and litter cover are still moderately high. The amount of bare soil has increased slightly with the extremely dry year, however the ratio of the distribution of protective cover to bare soil is still more than 3:1, indicating that there is still very good protection from erosion. In areas where bare interspaces appear, there are no signs of erosion, and this is usually where crested wheatgrass occurs. Soil trend is considered stable at this time. The sagebrush community has shifted to an even more mature population where 75% are classified as mature. Biotic potential is still moderately high at 19% and percentage of decadent plants has risen slightly, but still lower than 10%. All these combined factors indicate a stable browse trend. The perennial herbaceous understory sum of nested frequency has increased with only about 14% of the grass cover coming from annuals, whereas in 1995 they made up nearly 50% of the grass cover. The winter and summer have been so dry that the annuals did not become normally established. Forbs are infrequent and add little to the herbaceous understory.

The sum of nested frequency for the perennial component has gone down slightly. The increase of perennial grasses more than compensates for the slight losses to the perennial forbs. The trend for the herbaceous understory is stable.

#### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

#### HERBACEOUS TRENDS --

Herd unit 13B, Study no: 3

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
G	Agropyron cristatum	<sub>b</sub> 169	<sub>a</sub> 115	<sub>b</sub> 171	57	42	68	3.70	5.76
G	Bromus tectorum (a)	-	<sub>b</sub> 278	<sub>a</sub> 125	-	84	47	4.42	.77
G	Hilaria jamesii	76	97	65	27	37	25	3.12	.49
G	Poa fendleriana	<sub>a</sub> -	<sub>b</sub> 38	<sub>b</sub> 24	-	15	10	1.05	.12
G	Sitanion hystrix	<sub>b</sub> 9	<sub>ab</sub> 1	<sub>a</sub> -	4	1	-	.00	-
G	Sporobolus cryptandrus	-	-	2	-	-	1	-	.00
G	Stipa comata	<sub>b</sub> 70	<sub>a</sub> 8	<sub>a</sub> 21	28	5	11	.02	.35
G	Vulpia octoflora (a)	-	<sub>b</sub> 186	<sub>a</sub> 77	-	60	29	1.23	.36
Total for Annual Grasses		0	464	202	0	144	76	5.65	1.13
Total for Perennial Grasses		324	259	283	116	100	115	7.91	6.74
Total for Grasses		324	723	485	116	244	191	13.57	7.88
F	Agoseris glauca	-	2	-	-	1	-	.00	-
F	Astragalus convallarius	10	14	9	7	6	4	.44	.12
F	Astragalus mollissimus	<sub>a</sub> -	<sub>b</sub> 13	<sub>a</sub> 4	-	7	2	.18	.06
F	Castilleja linariaefolia	-	2	-	-	1	-	.03	.03
F	Carduus nutans (a)	-	2	-	-	1	-	.00	-
F	Cryptantha fulvocanescens	5	-	-	2	-	-	-	-
F	Cymopterus spp.	-	2	-	-	1	-	.00	-
F	Descurainia pinnata (a)	-	<sub>b</sub> 22	<sub>a</sub> 1	-	9	1	.04	.00
F	Draba nemorosa (a)	-	<sub>b</sub> 95	<sub>a</sub> 6	-	36	2	.20	.01
F	Erigeron pumilus	5	8	8	2	5	5	.02	.05
F	Gayophytum ramosissimum (a)	-	<sub>b</sub> 31	<sub>a</sub> -	-	11	-	.08	-
F	Gilia hutchinifolia (a)	-	<sub>b</sub> 43	<sub>a</sub> -	-	17	-	.08	-
F	Haplopappus acaulis	-	3	-	-	1	-	.00	-
F	Ipomopsis aggregata	-	1	-	-	1	-	.03	-
F	Lappula occidentalis (a)	-	<sub>b</sub> 18	<sub>a</sub> -	-	7	-	.06	-

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
F	Lepidium densiflorum (a)	-	<sub>b</sub> 21	<sub>a</sub> 2	-	9	1	.04	.00
F	Lithospermum spp.	-	6	-	-	2	-	.01	-
F	Lygodesmia spinosa	-	2	-	-	1	-	.00	-
F	Medicago sativa	<sub>b</sub> 4	<sub>a</sub> -	<sub>a</sub> -	3	-	-	-	-
F	Microsteris gracilis (a)	-	-	2	-	-	1	-	.00
F	Petradoria pumila	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 8	-	-	3	-	.06
F	Phlox hoodii	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 23	-	-	8	-	.26
F	Phlox longifolia	87	92	91	35	36	35	.33	.69
F	Plantago patagonica (a)	-	<sub>b</sub> 114	<sub>a</sub> 51	-	39	18	.27	.21
F	Polygonum douglasii (a)	-	<sub>b</sub> 9	<sub>a</sub> -	-	4	-	.02	-
F	Sisymbrium altissimum (a)	-	<sub>b</sub> 8	<sub>a</sub> -	-	3	-	.01	-
F	Sphaeralcea coccinea	<sub>ab</sub> 23	<sub>b</sub> 30	<sub>a</sub> 14	10	14	6	.27	.32
F	Streptanthus cordatus	-	1	-	-	1	-	.00	-
F	Trifolium spp.	-	3	-	-	1	-	.00	-
Total for Annual Forbs		0	363	62	0	136	23	0.82	0.24
Total for Perennial Forbs		134	179	157	59	78	63	1.34	1.60
Total for Forbs		134	542	219	59	214	86	2.17	1.84

Values with different subscript letters are significantly different at  $\alpha = 0.10$  (annuals excluded)

#### BROWSE TRENDS --

Herd unit 13B, Study no: 3

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata tridentata	56	63	11.60	16.71
B	Gutierrezia sarothrae	8	17	.05	.64
B	Juniperus osteosperma	0	7	6.21	6.83
B	Opuntia spp.	4	4	.38	.30
B	Pinus edulis	0	3	2.67	5.52
Total for Browse		68	94	20.93	30.02

#### CANOPY COVER --

Herd unit 13B, Study no: 3

Species	Percent Cover
	'00
Juniperus osteosperma	7
Pinus edulis	3

BASIC COVER --

Herd unit 13B, Study no: 3

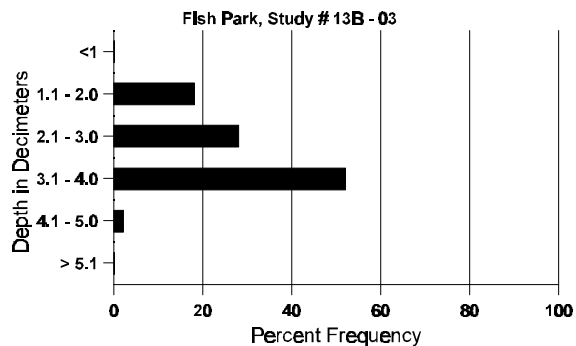
Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'86	'95	'00
Vegetation	370	323	16.50	37.57	40.97
Rock	34	12	0	.12	.33
Pavement	28	25	0	.04	.18
Litter	396	363	68.50	44.53	48.42
Cryptogams	182	192	0	5.65	10.93
Bare Ground	294	284	15.00	24.65	31.86

SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 3, Study Name: Fish Park

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
15.51	57.2 (16.06)	6.8	48.0	30.0	22.0	1.0	5.9	60.8	0.6

## Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 13B, Study no: 3

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	48	20	766	N/A
Elk	-	-	9	1 (2)
Deer	3	7	183	14 (35)
Cattle	5	1	35	3 (8)

## BROWSE CHARACTERISTICS --

Herd unit 13B, Study no: 3

Treatment Unit 15B, Study No. 5																	
A Y G R E	Form Class (No. of Plants)	Vigor Class									Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4	5	6	7	8	9		1	2		3	4	
Artemisia tridentata tridentata																	
S	86	28	-	-	-	-	-	-	-	-	28	-	-	-	933		28
	95	18	-	-	54	-	-	-	-	-	72	-	-	-	1440		72
	00	38	-	-	-	-	-	-	-	-	38	-	-	-	760		38
Y	86	48	-	-	-	-	-	-	-	-	47	-	-	1	1600		48
	95	39	-	-	18	-	-	-	-	-	51	-	6	-	1140		57
	00	16	-	-	16	-	-	-	-	-	32	-	-	-	640		32
M	86	11	5	-	-	-	-	-	-	-	16	-	-	-	533	24 20	16
	95	98	3	-	1	-	-	-	-	-	102	-	-	-	2040	29 42	102
	00	83	53	12	4	-	-	-	-	-	152	-	-	-	3040	28 38	152
D	86	4	-	-	-	-	-	-	-	-	3	-	1	-	133		4
	95	2	-	1	-	-	-	-	-	-	3	-	-	-	60		3
	00	8	5	4	-	1	-	-	-	-	14	-	-	4	360		18
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'86		07%			00%			03%			+30%						
'95		02%			.61%			04%			+20%						
'00		29%			08%			02%									
Total Plants/Acre (excluding Dead & Seedlings)												'86	2266	Dec:	6%		
												'95	3240		2%		
												'00	4040		9%		
Gutierrezia sarothrae																	
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
Y	86	3	-	-	-	-	-	-	-	-	3	-	-	-	100		3
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
M	86	12	-	-	-	-	-	-	-	-	12	-	-	-	400	7 8	12
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140	10 12	7
	00	82	-	-	-	-	-	-	-	-	82	-	-	-	1640	7 9	82
D	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'86		00%			00%			00%			-62%						
'95		00%			00%			00%			+88%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'86	533	Dec:	6%		
												'95	200		0%		
												'00	1640		0%		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Juniperus osteosperma																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33	61	44	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	00	4	-	-	-	-	-	2	1	-	7	-	-	-	140	-	-	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	33	Dec:	-			
												'95	0		-			
												'00	160		-			
Opuntia spp.																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180	4	18	
	00	19	-	-	-	-	-	-	-	-	19	-	-	-	380	4	10	
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	1	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			10%			+47%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	0%			
												'95	200		10%			
												'00	380		0%			
Pinus edulis																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100	-	-	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	100		-			

Trend Study 13B-4-00

Study site name: Red Cliffs .

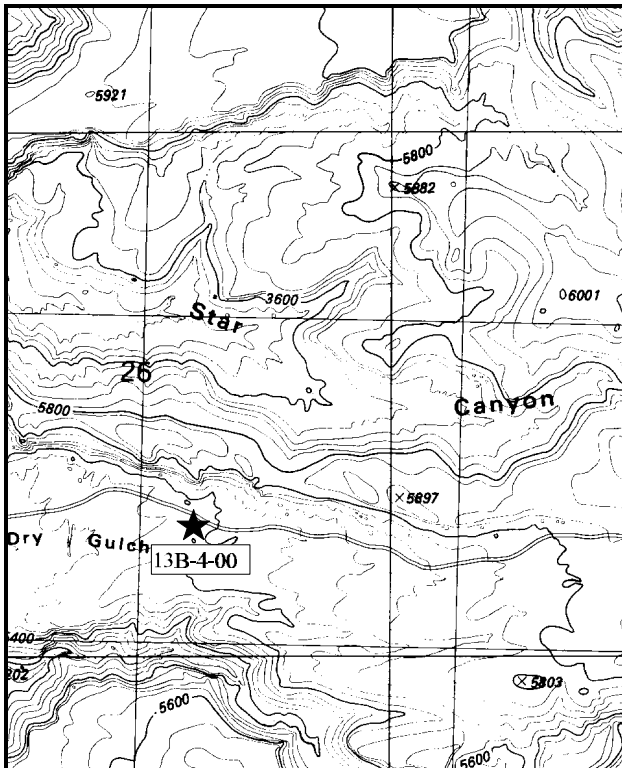
Range type: Blackbrush .

Compass bearing: frequency baseline 250°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (86ft). Belt rebar placement: belt 2@1ft, belt 3@2ft, belt 5@5ft.

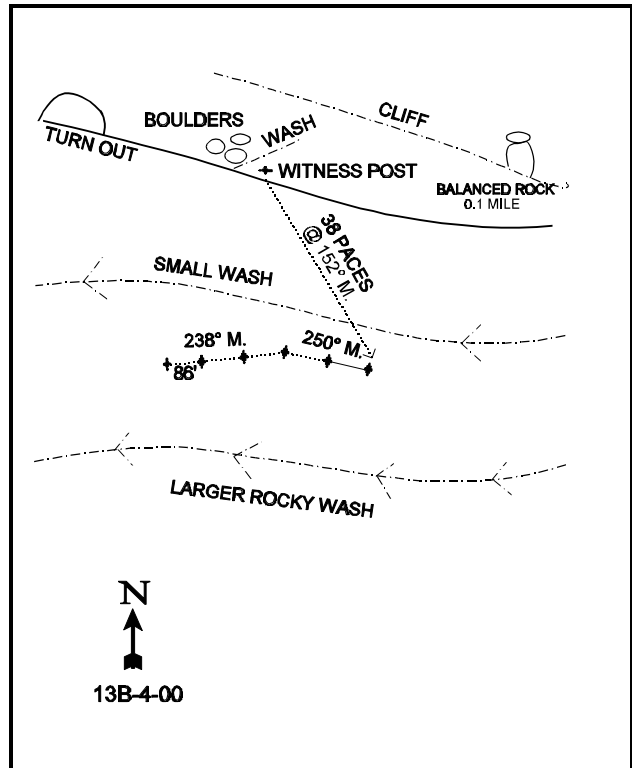
LOCATION DESCRIPTION

From the Utah-Colorado state line west of Glade Park, go west 2.1 miles on the Coates Creek Road to a cattle guard. Continue on the main road 2.1 miles to a P-J area bordered on the right by large sandstone cliffs. Here you will find a witness stake (fence post) on the right (north) side of the road. The baseline starts 140 feet south (across the road) from the witness post. A short rebar, tagged #7816, marks the 0-foot end.



Map Name: Marble Canyon

Township 21S , Range 25E , Section 26



Diagrammatic Sketch

UTM 4312310 N, 663114 E

## DISCUSSION

### Trend Study No. 13B-4 (34-4)

The Red Cliffs transect is located along the Coates Creek Road at an elevation of 5,630 feet. The area is dominated by pinyon-juniper and blackbrush. Steep orange sandstone cliffs are located just north and across the road from the site. The transect samples slightly rolling topography with exposures varying from north to south and west. Overall, the area drains to the west. There is a stock pond down the wash about one-tenth of a mile from the transect, although livestock do not appear to utilize this site. Deer and rabbit pellet groups are usually common in the area. To accommodate the increased sample size and stay within the same vegetative type, the position of the transect extension was slightly altered. A pellet-group transect run parallel to the baseline in 2000 indicated 44 deer days use/acre (18 ddu/ha), cow and elk were not sampled.

The moderately shallow soil is light orange in color and is composed of very fine particles which is loosely compacted on the surface. The soil texture is a sandy clay loam with a soil reaction that is mildly alkaline (pH 7.6). The amount of phosphorus in the soil (5.9ppm) could be a limiting factor where 10ppm is minimal for normal plant growth and development. Blackish rock and pavement is scattered throughout the site with an estimated combined cover of about 20%. More than half of the vegetative cover is contributed by blackbrush. An additional 14% of the total cover is contributed by annual grasses and forbs. Litter cover, estimated at 23% in 1995, is now down to 21%. Most of the litter is mostly beneath the crown of blackbrush. The bare soil interspaces between the blackbrush plants is protected by a few annuals, but a cryptogamic crust offers most of the cover in these interspaces. Some slight erosion, as well as pedestaling under the shrubs, was noted in 1995 and 2000.

The key browse species on this site is blackbrush which provided 50% of the vegetative cover in 1995, and currently contributes 58% of the total vegetative cover. Age class structure has changed little since 1986. This is a mature population (93-94%) with few young (2-3%) or decadent plants (4-5%). There were no seedlings encountered in either 1986 or 1995, however a few were classified in 2000 (biotic potential of <1%). Hedging is light to moderate and plants exhibit good vigor. Four percent of the population was classified as decadent in 1995 compared to 11% in 1986. Currently ('00) it has gone up to only 5%. Several other browse species were present but infrequently encountered. These include: broom snakeweed, Wyoming big sagebrush, cliffrose, prickly pear cactus, spiny hopsage, and green ephedra. Point-center quarter data in 2000 estimated 33 juniper trees/acre and 8 pinyon trees/acre.

Grasses and forbs combined for 35% of the vegetative cover in 1995, but with the very dry winter and summer, they only contribute to 17% of the total vegetative cover in 2000. Of the four grasses encountered, cheatgrass provided 90% of the grass cover in 1995. At this time it has decreased to 70% of the grass cover. It is still fairly abundant and found in nearly every quadrat, 96% vs 84% quadrat frequency respectively for 1995 and 2000. The remaining grasses include: mutton bluegrass, red threeawn, and needle-and-thread grass. Perennial forbs are rarely found, with an annual *Astragalus* sp. accounting for 95% of the forb cover in 1995. Because of the very dry winter and summer, this species was not found and the forb cover is now less than 1%.

### 1986 APPARENT TREND ASSESSMENT

The vegetative appears stable. Because of its abundance, blackbrush is the key browse species on this critical winter range. The browse density and population characteristics represent a healthy stand that appears to be stable. The site has potential to support a diverse perennial grass component. The soil trend appears to be slightly down due to some signs of erosion. Cryptogams are especially important on this site in reducing soil loss on the north-facing slope.

## 1995 TREND ASSESSMENT

The soil trend appears stable at this time, but in poor condition. The interspaces between the shrubs are protected by cryptogamic crusts which hold the soil in place. Although, if these crusts are disturbed, erosion will likely be accelerated. Vegetation and litter are associated mostly with the shrubs and provide some soil cover. Blackbrush has a stable population with increased vigor and decreased decadency. Other browse species don't appear to be expanding, therefore, the browse trend is stable. Perennial species in the interspaces would be more dependable at stopping erosion. Herbaceous understory is almost exclusively annual species. There is not really a concern for destructive fires because the annual species are mostly associated with the shrub crowns, leaving the interspaces with little fuel to carry a fire. Cryptogams still provide an important protective ground cover for this blackbrush community. The decrease in perennial nested frequency and the overall lack of perennial species leads to a slightly downward herbaceous understory trend.

### TREND ASSESSMENT

soil - stable (3), but only fair condition

browse - stable (3)

herbaceous understory - slightly downward (2)

## 2000 TREND ASSESSMENT

The soil trend appears to continue to be stable at this time, but still in poor condition. The interspaces between the shrubs are protected by cryptogamic crusts (which have increased by 25% since 1995) which help to hold the soil in place. Although, if these crusts are disturbed, erosion will likely be accelerated with high intensity summer storms. Vegetation and litter cover are associated mostly with the shrubs which provide some soil cover. Blackbrush continues to have a fairly stable population with improved vigor and stable decadency. Other browse species don't appear to be increasing, therefore the browse trend continues to be stable. Perennial species in the interspaces would be more dependable at stopping erosion, however the herbaceous understory currently provides less than 1% total cover. There is no real concern for destructive fires because the annual species are mostly associated with the shrub crowns, leaving the interspaces with little fine fuels to carry a fire. Cryptogams still provide an important protective ground cover for this blackbrush community. Currently cryptogams provide 20% cover. There is a slight increase in the sum of nested frequency of perennial grasses but nested frequency of perennial forbs remained stable. There is, however, an overall lack of perennial species on this site. Annuals make up almost 75% of the total herbaceous cover. Trend is considered stable but in poor condition.

### TREND ASSESSMENT

soil - stable (3), but only fair condition

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --  
Herd unit 13B, Study no: 4

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
G	<i>Aristida purpurea</i>	3	3	6	2	2	2	.30	.06
G	<i>Bromus tectorum</i> (a)	-	<sub>b</sub> 336	<sub>a</sub> 264	-	96	84	4.56	2.24
G	<i>Oryzopsis hymenoides</i>	-	-	5	-	-	2	-	.03
G	<i>Poa fendleriana</i>	<sub>b</sub> 110	<sub>a</sub> 21	<sub>a</sub> 11	39	10	7	.15	.13
G	<i>Poa secunda</i>	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 31	-	-	14	-	.68
G	<i>Sitanion hystrix</i>	5	-	-	2	-	-	-	-
G	<i>Sporobolus cryptandrus</i>	3	-	-	1	-	-	-	-
G	<i>Stipa comata</i>	-	3	-	-	1	-	.03	-
G	<i>Vulpia octoflora</i> (a)	-	<sub>a</sub> -	<sub>b</sub> 24	-	-	10	-	.05
Total for Annual Grasses		0	336	288	0	96	94	4.56	2.28
Total for Perennial Grasses		121	27	53	44	13	25	0.48	0.91
Total for Grasses		121	363	341	44	109	119	5.04	3.20
F	<i>Astragalus nuttallianus</i> (a)	<sub>a</sub> -	<sub>b</sub> 242	<sub>a</sub> -	-	80	-	6.36	-
F	<i>Calochortus nuttallii</i>	-	-	1	-	-	1	-	.00
F	<i>Cryptantha</i> spp.	-	2	-	-	1	-	.00	-
F	<i>Cymopterus</i> spp.	-	-	1	-	-	1	-	.00
F	<i>Draba nemorosa</i> (a)	-	<sub>a</sub> 12	<sub>b</sub> 33	-	5	17	.02	.08
F	<i>Erodium cicutarium</i> (a)	-	18	20	-	9	9	.19	.07
F	<i>Erigeron</i> spp.	-	1	-	-	1	-	.00	-
F	<i>Gilia hutchinsonii</i> (a)	-	14	10	-	7	4	.03	.64
F	<i>Lappula occidentalis</i> (a)	-	3	-	-	2	-	.01	-
F	<i>Lepidium perfoliatum</i>	<sub>a</sub> -	<sub>b</sub> 12	<sub>a</sub> -	-	5	-	.02	-
F	<i>Machaeranthera glabriusculas</i>	3	-	-	1	-	-	-	-
F	<i>Mentzelia</i> spp.	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 20	-	-	7	-	.03
F	<i>Navarretia intertexta</i> (a)	-	<sub>a</sub> -	<sub>b</sub> 7	-	-	3	-	.01
F	<i>Phlox longifolia</i>	<sub>a</sub> -	<sub>b</sub> 9	<sub>a</sub> -	-	3	-	.04	-
F	<i>Plantago patagonica</i> (a)	-	<sub>b</sub> 8	<sub>a</sub> -	-	3	-	.01	-
F	<i>Schoenocrambe linifolia</i>	-	1	-	-	1	-	.00	-
F	Unknown forb-annual (a)	-	2	-	-	1	-	.00	-
Total for Annual Forbs		0	299	70	0	107	33	6.64	0.81
Total for Perennial Forbs		3	25	22	1	11	9	.09	0.04
Total for Forbs		3	324	92	1	118	42	6.73	0.86

Values with different subscript letters are significantly different at  $\alpha = 0.10$  (annuals excluded)

## BROWSE TRENDS --

Herd unit 13B, Study no: 4

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	<i>Artemisia tridentata wyomingensis</i>	2	0	-	.84
B	<i>Chrysothamnus nauseosus albicaulis</i>	2	5	-	-
B	<i>Coleogyne ramosissima</i>	0	0	16.70	13.51
B	<i>Ephedra viridis</i>	81	72	-	-
B	<i>Grayia spinosa</i>	0	1	-	.38
B	<i>Gutierrezia sarothrae</i>	0	1	.04	.15
B	<i>Juniperus osteosperma</i>	3	2	4.65	4.22
B	<i>Opuntia</i> spp.	1	0	.03	.15
B	<i>Pinus edulis</i>	2	5	.38	-
B	<i>Sclerocactus</i>	0	11	-	.06
Total for Browse		91	97	21.80	19.30

## CANOPY COVER --

Herd unit 13B, Study no: 4

Species	Percent Cover
	'00
<i>Juniperus osteosperma</i>	3

## BASIC COVER --

Herd unit 13B, Study no: 4

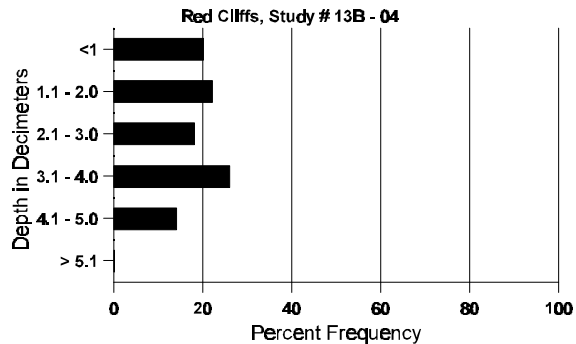
Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'86	'95	'00
Vegetation	360	300	13.75	33.59	24.73
Rock	201	188	16.25	11.28	13.46
Pavement	49	221	3.00	.08	6.66
Litter	375	331	25.00	23.32	20.85
Cryptogams	275	266	23.50	15.57	20.23
Bare Ground	297	327	18.50	25.61	30.77

SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 4, Study Name: Red Cliffs

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	% OM	PPM P	PPM K	dS/m
13.81	58.6 (13.46)	7.6	60.0	19.4	20.6	0.7	5.8	147.2	0.5

## Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 13B, Study no: 4

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	23	11	122	N/A
Deer	34	29	566	44 (108)

## BROWSE CHARACTERISTICS --

Herd unit 13B, Study no: 4

A Y G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata wyomingensis																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	1	-	-	-	-	-	-	-	1	-	-	-	20	26	41	1
	00	1	1	2	-	-	-	-	-	-	4	-	-	-	80	27	44	4
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		50%			00%			00%			+60%							
'00		20%			40%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	0%			
												'95	40		50%			
												'00	100		0%			
Chrysothamnus nauseosus hololeucus																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	15	42	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Chrysothamnus viscidiflorus stenophyllus																		
D	86	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	133	Dec:	100%			
												'95	0		0%			
												'00	0		0%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches)		Total					
		1	2	3	4		Ht.	Cr.						
Coleogyne ramosissima														
S	86	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	-	-	20		1
Y	86	6	-	-	-	-	-	-	-	-	6	-	-	6
	95	5	1	-	-	-	-	-	-	-	6	-	-	6
	00	3	-	-	1	-	-	-	-	-	4	-	-	4
M	86	22	33	2	82	5	-	-	-	-	130	-	14	144
	95	138	41	4	28	3	-	-	-	-	214	-	-	214
	00	13	6	-	161	20	-	-	-	-	200	-	-	200
D	86	3	5	6	1	3	-	-	-	-	13	-	5	18
	95	6	-	-	2	-	-	-	-	-	5	-	1	8
	00	6	-	-	4	-	-	-	-	-	7	-	-	10
X	86	-	-	-	-	-	-	-	-	-	-	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	60
	00	-	-	-	-	-	-	-	-	-	-	-	-	120
% Plants Showing		Moderate Use		Heavy Use		Poor Vigor		%Change						
'86		27%		05%		11%		-59%						
'95		20%		02%		01%		- 6%						
'00		12%		00%		01%								
Total Plants/Acre (excluding Dead & Seedlings)											'86	11200	Dec:	11%
											'95	4560		4%
											'00	4280		5%
Ephedra viridis														
M	86	-	-	-	-	-	-	-	-	-	-	0	-	0
	95	-	-	-	-	-	-	-	-	-	-	0	26	33
	00	1	-	-	-	-	-	-	-	-	1	-	-	1
% Plants Showing		Moderate Use		Heavy Use		Poor Vigor		%Change						
'86		00%		00%		00%								
'95		00%		00%		00%								
'00		00%		00%		00%								
Total Plants/Acre (excluding Dead & Seedlings)											'86	0	Dec:	-
											'95	0		-
											'00	20		-
Grayia spinosa														
M	86	-	-	-	-	-	-	-	-	-	-	0	-	0
	95	-	-	-	-	-	-	-	-	-	-	0	-	0
	00	-	-	-	1	-	-	-	-	-	1	-	-	1
% Plants Showing		Moderate Use		Heavy Use		Poor Vigor		%Change						
'86		00%		00%		00%								
'95		00%		00%		00%								
'00		00%		00%		00%								
Total Plants/Acre (excluding Dead & Seedlings)											'86	0	Dec:	-
											'95	0		-
											'00	20		-

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.			Total
		1	2	3	4	5	6	7	8	9	1	2	3	4					
Gutierrezia sarothrae																			
M	86	1	-	-	-	-	-	-	-	-	1	-	-	-	66	10	5	1	
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100	10	12	5	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	7	13	2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'86		00%			00%			00%			+34%								
'95		00%			00%			00%			-60%								
'00		00%			00%			00%											
Total Plants/Acre (excluding Dead & Seedlings)												'86	66	Dec:	-				
												'95	100		-				
												'00	40		-				
Juniperus osteosperma																			
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1	
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	00	1	-	-	-	-	-	1	-	-	2	-	-	-	40	22	48	2	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'86		00%			00%			00%											
'95		00%			00%			00%											
'00		00%			00%			00%											
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-				
												'95	0		-				
												'00	60		-				
Opuntia spp.																			
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	5	26	2	
	00	11	-	-	-	-	-	-	-	-	11	-	-	-	220	5	23	11	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'86		00%			00%			00%											
'95		00%			00%			00%			+82%								
'00		00%			00%			00%											
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-				
												'95	40		-				
												'00	220		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Sclerocactus																		
M	'86	1	-	-	-	-	-	-	-	-	1	-	-	-	66	7	3	1
	'95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	4	3	1
	'00	8	-	-	5	-	-	-	-	-	13	-	-	-	260	5	3	13
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'86 00%			00%			00%										
		'95 00%			00%			00%										
		'00 00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	66	Dec:	-			
												'95	20		-			
												'00	260		-			

Trend Study 13B-5-00

Study site name: Buckhorn Draw .

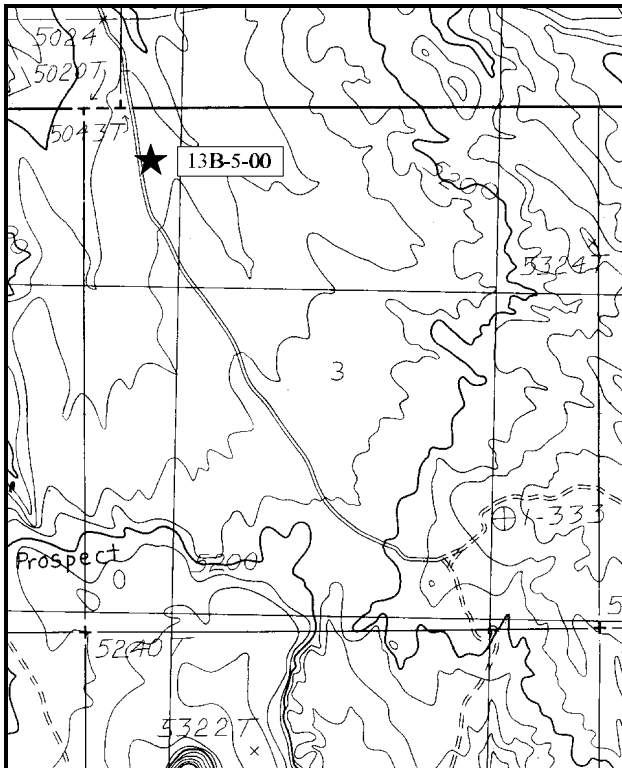
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

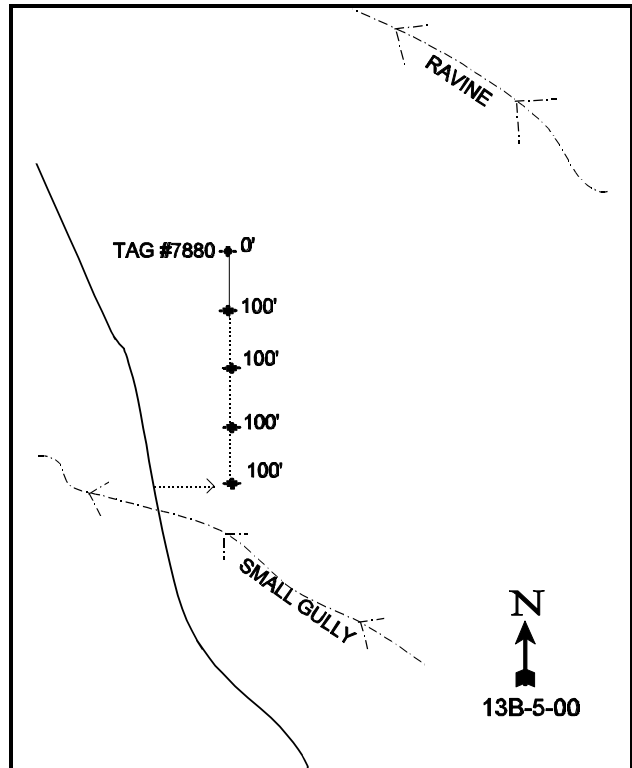
LOCATION DESCRIPTION

From the Utah-Colorado state line west of Glade Park travel 2.1 miles to a cattle guard. Continue west 2.1 miles to the Red Cliffs transect(13B-4-00). Continue west on the main road 4.0 miles to a fork. Stay left and go 2.4 miles to Coates Creek. Cross the creek and continue 0.6 miles to a fork. Stay left, go 2.5 miles to a cattle guard. Proceed 3.5 miles to another cattle guard. Go 0.3 miles past the cattle guard and stop. The transect is on the left (east) side of the road. The 0-foot end of the baseline (found 400 feet north) is also marked by a fence post, tagged #7880. All other plot markers are short rebar stakes.



Map Name: Blue Chief Mesa

Township 23S , Range 25E , Section 3



Diagrammatic Sketch

UTM 4300371.278 N, 660935.108 E

## DISCUSSION

### Trend Study No. 13B-5 (34-5)

The Buckhorn Draw site is a open bench at an elevation of about 5,100 feet. It is gently sloping (8%) to the northwest. Deep washes to the east and west intermittently carry water and drain to the north. The area supports a mixed desert shrub community dominated by broom snakeweed, Wyoming big sagebrush, spiny hopsage and perennial grasses with some scattered junipers. It is grazed by cattle and used as winter range for deer and elk. The area is within the Buckhorn allotment. This is a very large allotment consisting of 12 pastures. Grazing occurs on a deferred rotational basis from October 1<sup>st</sup> to May 30<sup>th</sup> using a holistic grazing plan of high intensity and short duration. In 1986, the BLM estimated use of sagebrush to be heavy (60%-80%), but much of this could be cow use, because it is a winter cattle allotment. Deer pellet groups were scattered throughout the area at moderate levels as well as moderate numbers for rabbit, with low counts for cattle and very low numbers for elk. Pellet-group transects data from 2000 estimate 1 elk days use/acre (<1edu/ha), 27 deer days use/acre (11 ddu/ha), and 20 cow days use/acre (8 cdu/ha).

The soil is a fine sandy loam, well drained, and deep with an effective rooting depth of 19 inches. There is a compacted layer of fine silty sand at about 12 inches with a noticeable accumulation of calcium carbonate. The soil reaction is mildly alkaline (pH 7.6) with a moderately high soil temperature (60° F). The amount of phosphorus in the soil could be a limiting factor at only 2.3 ppm, where 10 ppm is thought minimal for normal plant growth and development. Percent bare ground decreased between 1986 to 1995. However, since then with severe drought, percent bare soil has increased to a all time high of 55%. Protective ground cover comes from an almost equal percent of vegetation and litter. Most of the vegetative cover is contributed by grasses. Forbs are of little consequence on this site as they only provide about 1- 3% of the total vegetative cover with most of the cover provided by annual species. No rock or pavement cover was encountered on the site. The gentle slope mitigates erosion from becoming excessive, although there is one small gully running southwest of the transect.

The key browse species are Wyoming big sagebrush and spiny hopsage. In the past (1986), Wyoming big sagebrush had about as many decadent plants as mature plants in the population. Then in 1995, there was a higher proportion of mature plants with as well as a decreased percentage of decadent plants (from 40% to 12%). In 1995, 1/3 of the population was classified as young with a slightly higher proportion of seedlings compared to 1986 (13% vs 20% biotic potential). Mature plants also increased in height and crown measurements nearly doubled. In 1986, use was extremely heavy with 87% of the plants sampled exhibiting heavy hedging. In 1995 and 2000, use is mostly light to moderate with heavy use at only 6%-9%.

The spiny hopsage population is mature with moderate to heavy hedging. In exceptionally dry years, spiny hopsage tends to loose its leaves which makes it difficult to determine its true condition. Vigor was classified as poor on all plants sampled in 1986. Currently ('00) only about 1/4 of the plants sampled displayed poor vigor. Spiny hopsage is utilized primarily in the spring by livestock and wildlife with its usefulness decreasing into the summer. Broom snakeweed remains the most abundant browse species. It has a mostly mature population with little biotic potential (# of seedlings) being expressed at this time. Other less abundant shrubs include; cactus, green ephedra, and blackbrush. Junipers are scattered throughout the area with the point-center quarter method estimating a density of only about 28 trees/acre.

Through the years only about 1-3% of the vegetative cover comes from forbs, most of which are annual species. Grass cover is higher on this site than many of the other sites in this unit. Grasses on average provide 56% of the vegetative cover with a majority coming from perennial species (on average almost 72% of the grass cover). Sand dropseed provides most of the perennial herbaceous cover on this site. The other common perennial grass is three-awn, a warm season grass that has poor forage value most of the year. It is an increaser and most often

indicates long term range deterioration. Indian ricegrass is present at a moderate density. Cheatgrass provided 36% of the grass cover in 1995 with a 100% quadrat frequency. Now with the currently very dry year (2000), it provides only about 20% of the grass cover and has a quadrat frequency of only 86%. All forbs combined do not contribute even 1% total cover for any year sampled.

#### 1986 APPARENT TREND ASSESSMENT

The deteriorating population of the palatable spiny hopsage is an indication of a future downward browse trend. Sagebrush vigor is generally good, but this species may be harmed by increasing future use as hopsage becomes unavailable. Broom snakeweed is likely to increase, but numbers of this species fluctuate so much they are not a good indicator of trend. Little soil movement is detectable, although there is a large amount of bare soil in the interspaces. There is room for improvement in litter and vegetative cover. The soil trend appears to be stable at this time.

#### 1995 TREND ASSESSMENT

The relative amount of bare soil has decreased since 1986, but is still moderately high. No signs of erosion are present now, but this is more likely due to the almost level terrain of the site which lends itself to a more stable soil trend. Although there is ample grass cover, most of the grasses are increasers or invaders. Since the nested frequency for perennial grasses has stayed nearly the same and forbs comprise less than 3% of the vegetative cover, the herbaceous understory is stable but characterized by a poor species composition. The browse trend is slightly up with a more vigorous spiny hopsage population. The Wyoming big sagebrush population has fewer decadent plants and a higher proportion are classified as young plants. The broom snakeweed population should be monitored and could easily increase with poor management.

##### TREND ASSESSMENT

soil - stable (3)

browse - slightly upward (4)

herbaceous understory - stable (3) but poor composition

#### 2000 TREND ASSESSMENT

The relative amount of bare soil has increased since 1995, while relative percent cover of vegetation and litter declined. Trend for soil is considered slightly down. However, there are no signs of erosion present, but this is more likely due to the well drained characteristics of the sandy soil and almost level terrain of the site. The browse trend is stable with improvement to Wyoming big sagebrush but spiny hopsage is slightly down. The broom snakeweed population should be monitored and could easily increase with poor management. Since the nested frequency for perennial grasses has stayed nearly the same and forbs comprise less than 1% of the vegetative cover, herbaceous understory is stable.

##### TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --  
Herd unit 13B, Study no: 5

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
G	<i>Aristida purpurea</i>	68	73	75	27	33	30	2.42	3.20
G	<i>Bromus tectorum</i> (a)	-	<sub>b</sub> 353	<sub>a</sub> 237	-	100	86	4.07	2.65
G	<i>Oryzopsis hymenoides</i>	18	35	32	8	15	14	.20	.46
G	<i>Sporobolus cryptandrus</i>	156	137	160	63	56	61	4.66	6.79
G	<i>Vulpia octoflora</i> (a)	-	20	18	-	8	8	.04	.07
Total for Annual Grasses		0	373	255	0	108	94	4.11	2.72
Total for Perennial Grasses		242	245	267	98	104	105	7.28	10.46
Total for Grasses		242	618	522	98	212	199	11.40	13.18
F	<i>Calochortus nuttallii</i>	-	-	4	-	-	1	-	.00
F	<i>Cryptantha</i> spp.	<sub>a</sub> -	<sub>b</sub> 24	<sub>a</sub> -	-	10	-	.05	-
F	<i>Cymopterus</i> spp.	<sub>a</sub> -	<sub>ab</sub> 6	<sub>b</sub> 14	-	2	6	.01	.03
F	<i>Erodium cicutarium</i> (a)	-	<sub>a</sub> 5	<sub>b</sub> 12	-	2	6	.01	.03
F	<i>Eriogonum</i> spp.	-	15	-	-	6	-	.03	-
F	<i>Gilia</i> spp. (a)	-	-	3	-	-	1	-	.00
F	<i>Lappula occidentalis</i> (a)	-	-	1	-	-	1	-	.00
F	<i>Lepidium densiflorum</i> (a)	-	<sub>b</sub> 37	<sub>a</sub> 3	-	17	1	.08	.00
F	<i>Lygodesmia grandiflora</i>	<sub>a</sub> -	<sub>b</sub> 7	<sub>ab</sub> 3	-	4	1	.04	.00
F	<i>Plantago patagonica</i> (a)	-	<sub>b</sub> 147	<sub>a</sub> 29	-	65	13	.32	.06
F	<i>Sphaeralcea coccinea</i>	<sub>a</sub> -	<sub>b</sub> 19	<sub>a</sub> -	-	7	-	.06	-
Total for Annual Forbs		0	189	48	0	84	22	0.41	0.10
Total for Perennial Forbs		0	71	21	0	29	8	0.19	0.04
Total for Forbs		0	260	69	0	113	30	0.61	0.15

Values with different subscript letters are significantly different at  $\alpha = 0.10$  (annuals excluded)

## BROWSE TRENDS --

Herd unit 13B, Study no: 5

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	<i>Artemisia tridentata wyomingensis</i>	31	28	.82	1.63
B	<i>Coleogyne ramosissima</i>	3	5	-	1.63
B	<i>Grayia spinosa</i>	33	28	3.76	4.67
B	<i>Gutierrezia sarothrae</i>	65	71	3.95	1.60
B	<i>Opuntia</i> spp.	4	8	.06	.33
B	<i>Sclerocactus</i>	0	1	-	-
Total for Browse		136	141	8.60	9.89

## BASIC COVER --

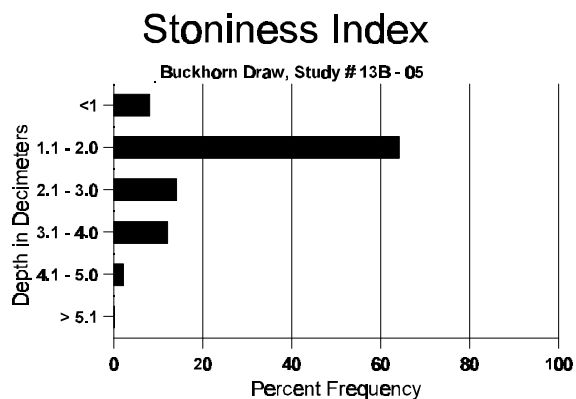
Herd unit 13B, Study no: 5

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'86	'95	'00
Vegetation	357	300	8.50	24.78	23.74
Rock	-	-	0	0	0
Pavement	-	3	0	0	.00
Litter	382	355	42.00	25.71	24.92
Cryptogams	133	155	.75	2.11	5.05
Bare Ground	278	357	48.75	33.26	54.67

## SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 5, Study Name: Buckhorn Draw

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	% OM	PPM P	PPM K	dS/m
18.87	60.4 (18.03)	7.6	64.0	18.0	18.0	0.3	2.3	99.2	0.6



PELLET GROUP FREQUENCY --

Herd unit 13B, Study no: 5

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre	Days Use per Acre (ha)
			00	00
Rabbit	21	19	270	N/A
Elk	2	1	17	1 (2)
Deer	28	23	348	27 (67)
Cattle	5	9	235	20 (49)

BROWSE CHARACTERISTICS --

Herd unit 13B, Study no: 5

A Y G R E	Form Class (No. of Plants)										Vigor Class				Plants Per Acre	Average (inches)		Total
	1	2	3	4	5	6	7	8	9	1	2	3	4	Ht. Cr.				
Artemisia tridentata wyomingensis																		
S	86	1	1	-	-	-	-	-	-	-	1	1	-	-	66		2	
	95	10	-	-	-	-	-	-	-	-	10	-	-	-	200		10	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	86	-	-	2	-	-	-	-	-	-	2	-	-	-	66		2	
	95	16	1	-	-	-	-	-	-	-	17	-	-	-	340		17	
	00	4	-	-	5	-	-	-	-	-	9	-	-	-	180		9	
M	86	-	1	6	-	-	-	-	-	-	7	-	-	-	233	11 13	7	
	95	4	22	2	-	-	-	-	-	-	28	-	-	-	560	16 24	28	
	00	25	11	3	3	2	-	-	-	-	44	-	-	-	880	17 22	44	
D	86	-	1	5	-	-	-	-	-	-	6	-	-	-	200		6	
	95	4	1	-	-	-	1	-	-	-	2	-	-	4	120		6	
	00	-	1	-	2	-	2	-	-	-	4	-	-	1	100		5	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'86		13%				87%				00%				+51%				
'95		47%				06%				08%				+12%				
'00		24%				09%				02%								
Total Plants/Acre (excluding Dead & Seedlings)												'86	499	Dec:	40%			
												'95	1020		12%			
												'00	1160		9%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus nauseosus																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	14	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Chrysothamnus viscidiflorus stenophyllus																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	18	35	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Coleogyne ramosissima																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	86	-	-	5	-	-	-	-	-	-	5	-	-	-	166	15	31	5
	95	-	-	-	1	1	-	-	-	-	2	-	-	-	40	27	50	2
	00	4	-	-	2	-	-	-	-	-	6	-	-	-	120	21	36	6
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			100%			00%			-64%							
'95		33%			00%			00%			+63%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	166	Dec:	-			
												'95	60		-			
												'00	160		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Ephedra viridis																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	27	27	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Grayia spinosa																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	4	22	4	-	-	-	26	-	4	-	600	17	33	30
	00	5	1	-	-	-	-	-	-	-	6	-	-	-	120	18	33	6
D	86	-	-	9	-	-	-	-	-	-	-	-	9	-	300			9
	95	3	1	-	1	6	1	-	-	2	6	-	3	5	280			14
	00	-	-	-	29	-	15	1	-	-	33	-	-	12	900			45
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			100%			100%			+66%							
'95		66%			16%			27%			+14%							
'00		02%			29%			24%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	300	Dec:	100%			
												'95	880		32%			
												'00	1020		88%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches)		Total						
		1	2	3	4		Ht.	Cr.							
Gutierrezia sarothrae															
S	86	-	-	-	-	-	-	-	-	-	-	0		0	
	95	3	-	-	2	-	-	-	-	-	-	100		5	
	00	3	-	-	-	-	-	-	-	-	-	60		3	
Y	86	26	-	-	-	-	-	-	-	-	-	866		26	
	95	29	-	-	-	-	-	-	-	-	-	580		29	
	00	35	-	-	-	-	-	-	-	-	-	700		35	
M	86	171	1	-	-	-	-	-	-	-	-	5733	9	5	172
	95	131	-	-	3	-	-	-	-	-	-	2680	11	15	134
	00	157	-	-	-	-	-	-	-	-	-	3140	6	8	157
D	86	33	1	1	-	-	-	-	-	-	-	1166		35	
	95	-	-	-	-	-	-	-	-	-	-	0		0	
	00	11	-	-	-	-	-	-	-	-	11	220		11	
X	86	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	840		42	
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>							
'86		.85%		.42%		00%		-58%							
'95		00%		00%		00%		+20%							
'00		00%		00%		05%									
Total Plants/Acre (excluding Dead & Seedlings)											'86	7765	Dec:	15%	
											'95	3260		0%	
											'00	4060		5%	
Juniperus osteosperma															
M	86	1	-	-	-	-	-	-	-	-	1	33	63	63	1
	95	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>							
'86		00%		00%		00%									
'95		00%		00%		00%									
'00		00%		00%		00%									
Total Plants/Acre (excluding Dead & Seedlings)											'86	33	Dec:	-	
											'95	0		-	
											'00	0		-	
Opuntia spp.															
M	86	2	-	-	-	-	-	-	-	-	2	66	4	6	2
	95	6	-	-	-	-	-	-	-	-	4	120	6	17	6
	00	11	-	-	-	-	-	-	-	-	11	220	7	12	11
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>							
'86		00%		00%		00%		+45%							
'95		00%		00%		33%		+45%							
'00		00%		00%		00%									
Total Plants/Acre (excluding Dead & Seedlings)											'86	66	Dec:	-	
											'95	120		-	
											'00	220		-	

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Sclerocactus																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	5	3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	20		-			

### Trend Study 13B-6-00

Study site name: Ryan Creek .

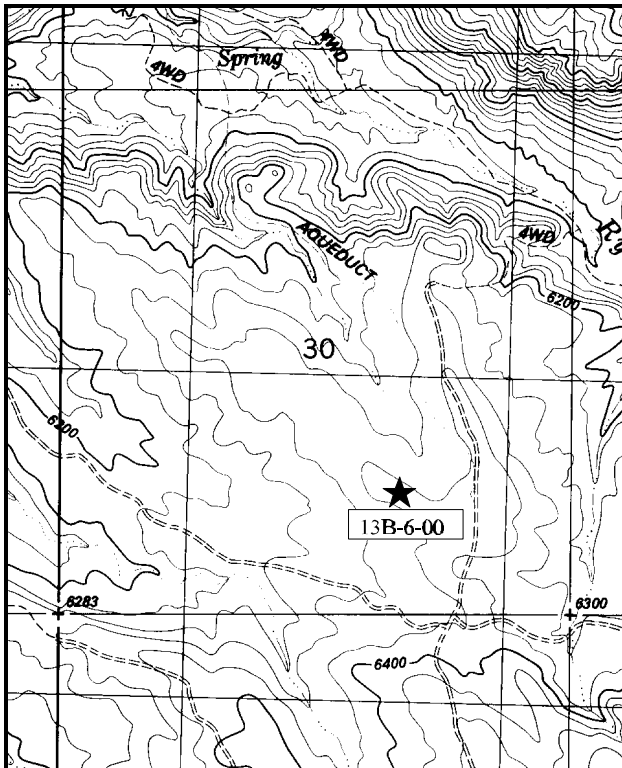
Range type: Chained, Seeded P-J

Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

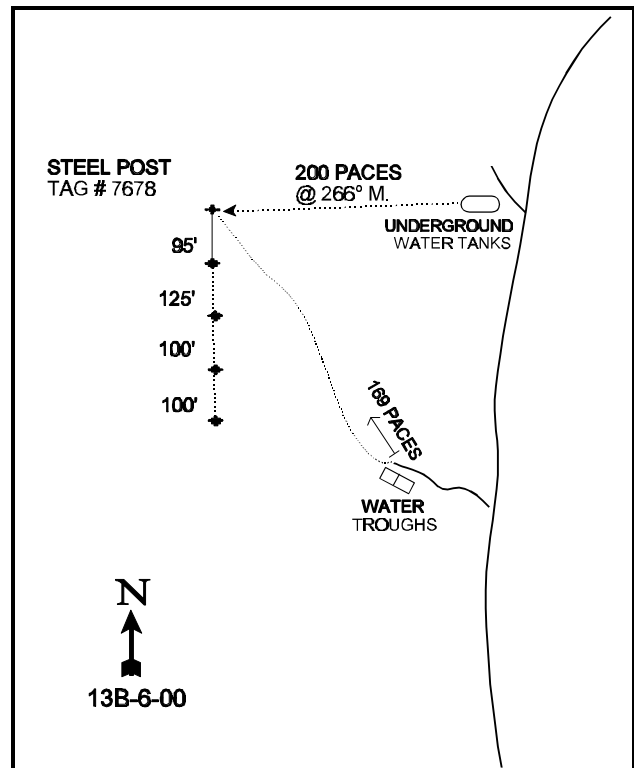
### LOCATION DESCRIPTION

At the "Granary" intersection just south 1.35 miles south of Buckhorn Draw, 13B-5-00 (Coates Creek 15-minute Quad; T23S, R25E, southeast quarter of section 3) bear left and go east 0.7 miles to a fork. Take the middle fork, go 2.4 miles and turn right at the next fork. Continue 0.7 miles to another fork. Turn left. Go 0.65 miles to a cattle guard. Continue 1.5 miles to a fork. Bear left and go 0.2 miles to a water development on the left. Drive up to the water troughs. From here, go up the small ridge to the west for 200 paces to a full high fence post with browse tag #7678 attached. This fence post, the 0-foot baseline stake, can also be located from the nearby underground water tanks by going 1060 feet on a bearing of 266°M degrees true from the tanks. The transect runs south from the start of the baseline. All other plots are marked by rebar stakes.



Map Name: Steamboat Mesa

Township 22S , Range 26E , Section 30



Diagrammatic Sketch

UTM 4302649.514 N, 666581.630 E

## DISCUSSION

### Trend Study No. 13B-6 (34-6)

The Ryan Creek transect is located within an old 1,800 acre pinyon-juniper chaining, which in the past had been considered an important big-game winter range. The area was chained and aerially seeded with crested wheatgrass, four-wing saltbush, big sagebrush, alfalfa, and bitterbrush in 1968. To help maintain the integrity of the chaining, the BLM used the herbicide tebuthiuron to eliminate the released population of pinyon-juniper trees on 300 acres of the chaining. The area has burned in 1989 which eliminated nearly all of the browse on the site. The study is located near the top of a south-facing slope at an elevation of 6,300 feet. A nearby deer pellet group transect in Ryan Park, on the Utah side, averaged 8 deer days use/acre (20 ddu/ha) between 1986 and 1996. Pellet group data taken along the trend study site base line in 2000 estimated 20 deer days use/acre (49 ddu/ha), 9 elk days use/acre (22 edu/ha), and 10 cow day use/acre (25 cdu/ha). Cattle grazing occurs as part of the large Buckhorn allotment.

The area is characterized as an upland shallow loam site. The surface soil has a sandy clay loam texture. Effective rooting depth is just over 14 inches. Soil reaction is neutral (pH 7.3). The low amount of phosphorus (7.7ppm) could be limiting as 10ppm is thought necessary for normal plant development and growth. The amount of bare ground has increase substantially from 13% in 1995 to 35% in 2000. However, the vegetation and litter still provides adequate protection for the soil and there is no evidence of noticeable erosion.

The pinyon and juniper trees and a very low density of miscellaneous browse were eliminated from the site when it burned. Previously the estimated combined density of pinyon and juniper trees was about 198 trees/acre. The most numerous shrubs on the site after the burn are Harriman's yucca, broom snakeweed, white stemmed rabbitbrush, and a few scattered fourwing saltbush. The estimated cover for all browse species combined is less than 1% cover. With the loss of the browse species, this site is no longer important as critical winter range for wildlife.

In 1995, grasses contributed to 80% of the total vegetative cover with the dominant understory species being cheatgrass. At that time it contributed 74% of the grass cover and being very dense it had the potential of carrying another destructive fire. However, currently ('00) it only makes up 9% of the grass cover with the very dry year we have experienced in 2000. Without the competition with cheatgrass, crested wheatgrass has gone from providing 22% to currently 79% of the total grass cover. Other grass species include; Indian ricegrass, galleta, purple threeawn, mutton bluegrass, and bottlebrush squirreltail. In 1995, forbs were composed primarily of annual species (51%). Now with dry conditions, only 14% of the forbs are annual species. The dominant perennial forb in 1995 was heath aster which doesn't provide much forage for wildlife or livestock. With the current survey, alfalfa is the dominant forb, providing 54% of the forb cover. It continues to appear very robust and vigorous.

### 1986 APPARENT TREND ASSESSMENT

Density of desirable browse species for deer is very low with little recruitment into their respective populations. However, there is good quantities of forage produced by the crested wheatgrass for the spring and fall. It will be interesting to follow the effects of the Savory grazing system on this particular chaining. Continued maintenance of the pinyon-juniper trees on this chaining is desirable for improving the health of the understory vegetation. Apparent trend for the site is stable, but will be greatly affected by ongoing management decisions and weather patterns.

## 1995 TREND ASSESSMENT

There is adequate cover provided by vegetation and litter to protect the soil surface from erosion. Therefore, the soil trend is considered stable. The herbaceous understory is comprised mostly of annual forbs and grasses, the majority of which is cheatgrass. Crested wheatgrass is abundant as well and may provide some forage later into the fall with some late precipitation. Tumble mustard is quite prevalent and most were knee high in height. The vegetation provides abundant fine fuels for another wildfire. Trend for the herbaceous understory is down because of the poor composition. There are very few, if any browse species that could provide winter forage for wildlife, so the trend for browse is down.

### TREND ASSESSMENT

soil - stable (3)

browse - down (1) with the loss of the browse to wildfire

herbaceous understory - downward (1) because of poor composition

## 2000 TREND ASSESSMENT

Protective ground cover has declined since 1995 while percent cover of bare ground has more than doubled from 13% to 35%. The ratio of protective cover to bare ground increased from 3.1:1 to 2.2:1. Most of this change in cover can be explained by the decline in annual grasses and forbs. Percent cover of cheatgrass declined from 19% in 1995 to only 2% now. Annual forbs declined from 6% cover to 3% cover. At the same time perennial grass cover increased from 6% to 17%. Sum of nested frequency of perennial grasses remained similar. There appears to be adequate cover provided by vegetation and litter to prevent most erosion but due to the increase in unprotected bare ground the soil trend is considered slightly down. The herbaceous understory has changed noticeably from mostly annual forbs and grasses (69%), to where they now only make up 10% of the total vegetative cover. Crested wheatgrass has increased from 18% to 66% of the vegetative cover. Trend for the herbaceous understory is stable because the perennial component of the grasses showed slight improvement with a substantial decrease in the abundance annual species. The forbs showed a decrease, however they only make up 14% of the herbaceous cover and this loss was easily compensated by the increase in perennial grass nested frequency values. There are very few, if any browse species that could provide winter forage for wildlife. Trend is considered stable but in very poor condition.

### TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3) with few shrubs present

herbaceous understory - stable (3) with good increases for the perennial grass species

HERBACEOUS TRENDS --

Herd unit 13B, Study no: 6

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
G	<i>Agropyron cristatum</i>	<sub>b</sub> 286	<sub>a</sub> 215	<sub>b</sub> 255	95	75	89	5.60	14.70
G	<i>Aristida purpurea</i>	<sub>a</sub> -	<sub>a</sub> 1	<sub>b</sub> 7	-	1	4	.00	.24
G	<i>Bromus tectorum</i> (a)	-	<sub>b</sub> 365	<sub>a</sub> 138	-	100	55	18.56	1.72
G	<i>Hilaria jamesii</i>	-	3	7	-	1	2	.15	.53
G	<i>Oryzopsis hymenoides</i>	<sub>a</sub> -	<sub>b</sub> 12	<sub>b</sub> 12	-	4	4	.57	1.10
G	<i>Poa fendleriana</i>	-	2	-	-	2	-	.03	-
G	<i>Sitanion hystrix</i>	2	4	4	2	1	2	.00	.18
G	<i>Sporobolus cryptandrus</i>	-	-	2	-	-	1	-	.15
G	<i>Vulpia octoflora</i> (a)	4	3	-	1	1	-	.00	-
Total for Annual Grasses		4	368	138	1	101	55	18.57	1.72
Total for Perennial Grasses		288	237	287	97	84	102	6.37	16.90
Total for Grasses		292	605	425	98	185	157	24.95	18.63
F	<i>Astragalus mollissimus</i>	2	7	1	1	5	1	.02	.00
F	<i>Astragalus nuttallianus</i>	<sub>a</sub> -	<sub>b</sub> 6	<sub>a</sub> -	-	4	-	.02	-
F	<i>Chenopodium fremontii</i> (a)	-	-	3	-	-	1	-	.00
F	<i>Cymopterus</i> spp.	-	3	6	-	1	2	.00	.01
F	<i>Draba nemorosa</i> (a)	-	6	2	-	2	1	.01	.00
F	<i>Erodium cicutarium</i> (a)	-	<sub>b</sub> 125	<sub>a</sub> 24	-	48	11	1.60	.39
F	<i>Euphorbia</i> spp.	<sub>a</sub> -	<sub>b</sub> 14	<sub>b</sub> 13	-	7	6	.03	.10
F	<i>Lappula occidentalis</i> (a)	-	5	3	-	3	1	.01	.00
F	<i>Lactuca serriola</i>	<sub>a</sub> -	<sub>b</sub> 6	<sub>ab</sub> 4	-	4	2	.02	.01
F	<i>Leucelene ericoides</i>	<sub>a</sub> -	<sub>b</sub> 28	<sub>b</sub> 38	-	10	12	1.46	.79
F	<i>Machaeranthera</i> spp	<sub>a</sub> -	<sub>b</sub> 127	<sub>a</sub> -	-	47	-	.28	-
F	<i>Medicago sativa</i>	<sub>a</sub> 1	<sub>b</sub> 24	<sub>ab</sub> 12	1	12	6	.84	1.60
F	<i>Phlox longifolia</i>	-	-	3	-	-	1	-	.00
F	<i>Salsola iberica</i> (a)	-	1	-	-	1	-	.00	-
F	<i>Sisymbrium altissimum</i> (a)	-	<sub>b</sub> 150	<sub>a</sub> 2	-	65	2	1.22	.01
F	<i>Silene</i> spp.	-	5	-	-	2	-	.01	-
F	<i>Sphaeralcea coccinea</i>	-	-	3	-	-	1	-	.03
F	Unknown forb-perennial	2	-	-	1	-	-	-	-
Total for Annual Forbs		0	287	34	0	119	16	2.85	0.41
Total for Perennial Forbs		5	220	80	3	92	31	2.70	2.55
Total for Forbs		5	507	114	3	211	47	5.56	2.97

Values with different subscript letters are significantly different at % = 0.10 (annuals excluded)

# BROWSE TRENDS --

Herd unit 13B, Study no: 6

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Chrysothamnus nauseosus hololeucus	1	1	.15	.15
B	Gutierrezia sarothrae	1	4	.15	.15
B	Yucca harrimaniae	5	4	.30	.30
Total for Browse		7	9	0.60	0.61

# BASIC COVER --

Herd unit 13B, Study no: 6

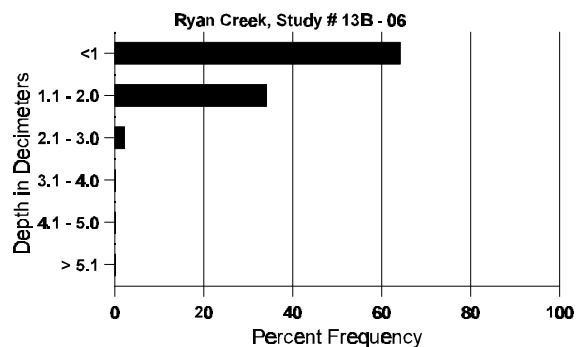
Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'86	'95	'00
Vegetation	381	324	7.25	41.22	23.49
Rock	262	265	4.00	13.35	16.52
Pavement	92	242	4.00	1.11	3.95
Litter	384	365	53.00	45.07	22.25
Cryptogams	42	69	2.25	.61	1.08
Bare Ground	259	342	29.50	13.15	34.65

# SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 6, Study Name: Ryan Creek

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
14.30	58.6 (15.91)	7.3	64.0	15.4	20.6	4.9	7.7	80.0	1.0

## Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 13B, Study no: 6

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	00	00
Rabbit	6	38	252	N/A
Elk	12	4	122	9 (24)
Deer	17	29	261	20 (50)
Cattle	3	4	122	10 (26)

BROWSE CHARACTERISTICS --

Herd unit 13B, Study no: 6

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht. Cr.		
Artemisia tridentata wyomingensis																		
D	86	-	-	-	-	-	1	-	-	-	1	-	-	-	33		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			100%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	33	Dec:	100%			
												'95	0		0%			
												'00	0		0%			
Atriplex canescens																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	28	27	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	39	34	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Chrysothamnus nauseosus hololeucus																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	30	46	1
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20	36	63	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	20		-			
												'00	20		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	86	2	-	-	-	-	-	-	-	-	2	-	-	-	66	10	11	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	7	22	
	00	11	-	-	-	-	-	-	-	-	11	-	-	-	220	7	7	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%			-70%							
'95		00%			00%			00%			+93%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	66	Dec:	-			
												'95	20		-			
												'00	280		-			
Juniperus osteosperma																		
M	86	2	-	-	-	-	-	-	-	-	2	-	-	-	66	98	79	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	66	Dec:	-			
												'95	0		-			
												'00	0		-			
Pinus edulis																		
Y	86	2	-	-	-	-	-	-	-	-	2	-	-	-	66		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	86	2	-	-	-	-	-	-	-	-	2	-	-	-	66	78	50	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	132	Dec:	-			
												'95	0		-			
												'00	0		-			

A Y G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Yucca harrimaniae																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	33	-	-	-	-	-	-	-	-	33	-	-	-	660	10	14	33
	00	1	-	-	4	-	-	-	-	-	5	-	-	-	100	13	19	5
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	3	-	-	4	-	-	-	-	-	3	-	-	4	140			7
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'86			00%			00%			00%							
		'95			00%			00%			00%							
		'00			00%			00%			33%							
Total Plants/Acre (excluding Dead & Seedlings)														'86		0	Dec:	0%
														'95		680		3%
														'00		240		58%

### Trend Study 13B-7-00

Study site name: Steamboat Mesa North.

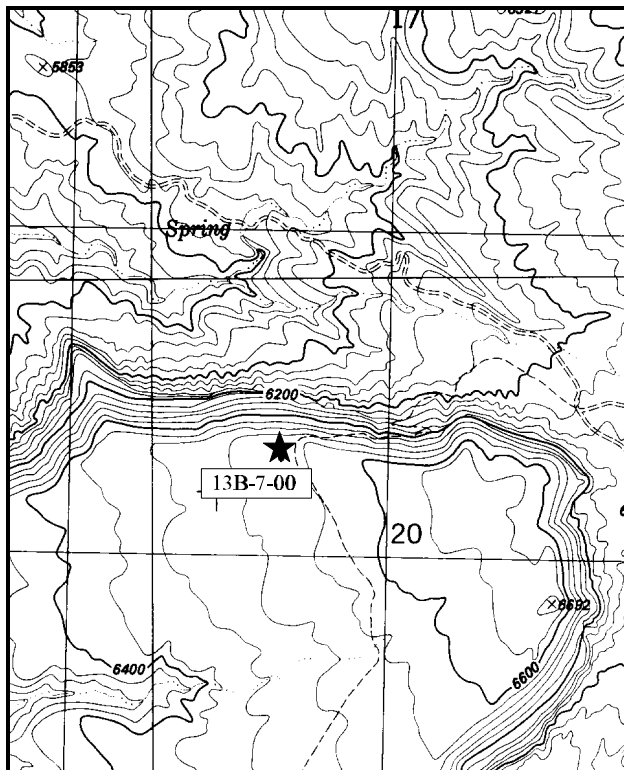
Range type: Chained, Seeded P-J.

Compass bearing: frequency baseline 165°M.

Footmark first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

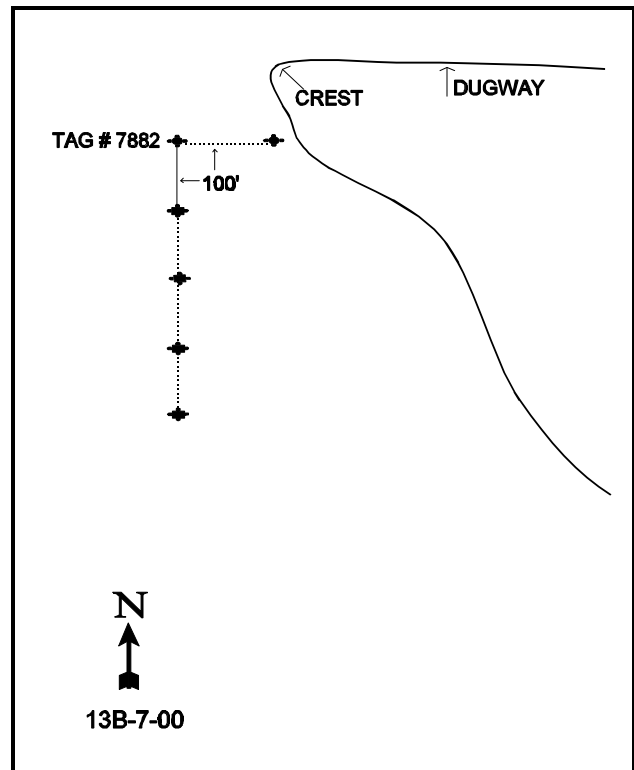
### LOCATION DESCRIPTION

From the Buckhorn Draw transect (13B-5). Continue southeast for 1.35 miles to the "Granary" intersection. Turn right and go 0.2 miles to a fork. Stay left. Go 1.55 miles and turn left. Go down this road 0.7 miles to Granite Creek. Cross the creek and proceed 4.8 miles to a fork. Stay left, then right at another fork which connects back to the main road, traveling 0.4 miles to a stock pond. Continue 0.15 miles to a fork with many branches (the right goes up on Steamboat Mesa). It is 0.9 miles from the fork to the top of Steamboat Mesa and a witness post on the right side of the road. The witness post (a green fence post) is six feet off the road. The 0-foot baseline stake is 100 feet west of the witness post. All the transect posts are rebar.



Map Name: Steamboat Mesa

Township 23S, Range 26E, Section 20



Diagrammatic Sketch

UTM 4295207.117 N, 666727.059 E

## DISCUSSION

### Trend Study No. 13B-7 (34-7)

The Steamboat Mesa North study lies on a large flat mesa located in the southeast corner of the Dolores Triangle, just north of the Dolores River and west of the Colorado border. The mesa is surrounded by steep rock cliffs, with the only access being a rough 4-wheel drive road on the north end. This transect was set up in a large chaining just beyond the north edge of the mesa. The study is located on a slight slope (3-5%) with a southwest aspect and an elevation of 6,600 feet. Managed by the BLM, this portion of the Steamboat Mesa allotment was two-way chained and seeded in 1968. Species seeded were crested wheatgrass, four-wing saltbush, big sagebrush, alfalfa, and bitterbrush. The allotment is grazed by cattle from December through mid-April for 884 AUM's. Key forage species are crested wheatgrass, and scattered Wyoming big sagebrush, white stemmed rabbitbrush, green ephedra, and bitterbrush. Data from a pellet group transect run parallel to the study site baseline in 2000 estimates 42 deer days use/acre (104 ddu/ha), and 17 cow days use/acre (42 cdu/ha).

The soil is shallow and well-drained. The soil is classified as a sandy clay loam derived from sandstone. It has a mildly alkaline pH of 7.7. Soil depth is variable, from very shallow to moderately deep, with rock scattered throughout the soil profile, effective rooting depth on average is almost 12 inches. Low phosphorus at 8.7 ppm may be limiting as 10ppm has been shown to be the minimum necessary for normal plant growth and development. Litter accounts for almost 47% of the ground cover, much of which was left from the chaining. Vegetative cover is currently about 33% with about 5% to 9% combined rock and pavement cover. Percent bare ground has increased since 1986 from 23% to 39%. The ratio of bare soil to protective cover has remained almost the same. There are a few shallow bare spots, but overall, no signs of active erosion on the site.

The overstory canopy cover from pinyon and juniper trees is 9%. Point-center quarter from 2000 estimates tree densities at 177 pinyon/acre and 142 juniper/acre. True mountain mahogany, Antelope bitterbrush, rubber rabbitbrush, Wyoming big sagebrush, black sagebrush, Utah serviceberry, and fourwing saltbush, although all found at low densities, display good vigor and only light hedging. Green ephedra and fourwing saltbush show moderate hedging with some appearing to be in poor condition. This is generally normal for these two species where they are found in low densities.

Crested wheatgrass is the key forage species for cattle. It accounts for nearly all of the grass cover and forms large, distinct patches over the site. Cheatgrass was the next dominant grass in 1995 yet it only made up 13% of the grass cover. It has since declined significantly in frequency and currently accounts for <1% of the grass cover. Other important forage grasses are Indian ricegrass and mutton bluegrass. Needle and thread grass was sampled in 1986 as an important forage grass, but was not found in 1995. However, it was sampled again in 2000.

A variety of native perennial forbs are found on the site, although none are particularly important in terms of forage value on winter range. Most common are increasers such as rock goldenrod, Hoods phlox, and hairy gold aster. Alfalfa is scattered throughout the site in very low densities.

### 1986 APPARENT TREND ASSESSMENT

Juniper and pinyon are becoming more dominant on this site and will begin to impact the more desirable browse species. However, there is a potential for the other shrubs to increase. The BLM resource management plan addresses the need to "maintain" this chaining. Big game habitat could be improved if maintenance involved tree removal to release the more desirable browse species. The variety of grasses and forbs currently provide good spring forage. The long-term vegetative trend would be considered down without intervention. The soil trend appears stable at this time.

## 1995 TREND ASSESSMENT

Bare ground has increased since 1986 although there are no signs of active erosion. The increase in bare ground is due to the lack of litter produced with drier conditions in recent years. Therefore, the soil trend is stable. Currently, grasses provide good spring forage. There is a wide variety of annual species found on the site as well. Most of the cheatgrass is found in large patches with crested wheatgrass scattered throughout. Although nested frequency for perennial forb species has increased, most are increasers and of little forage value. The herbaceous understory trend is slightly upward, although, a different composition may be desirable. Pinyon and juniper combine for 305 trees/acre. Browse species are scattered throughout in low densities with most showing little utilization. This leads to a stable browse trend.

### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly upward (4)

## 2000 TREND ASSESSMENT

Bare ground has increased slightly again since 1995, yet the ratio of bare soil to protective cover is almost unchanged and there are no signs of active erosion. The increase in bare ground is due to the exceptionally dry year we have just experienced. Therefore, the soil trend is stable. Currently, grasses provide good spring forage. There is a wide variety of annual species found on the site, although they are in reduced numbers with the drought. Nested frequency for perennial forb species has decreased, while that for the perennial grasses increased. Since forbs only make up 15% of the herbaceous cover, the herbaceous understory trend is considered slightly upward for the perennial grasses, with the composition shifting to more perennial species. Pinyon and juniper density appears stable. Browse species are scattered throughout in low densities with most showing little utilization. This leads to a stable browse trend.

### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly upward (4)

HERBACEOUS TRENDS --  
Herd unit 13B, Study no: 7

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
G	Agropyron cristatum	<sub>a</sub> 155	<sub>b</sub> 228	<sub>c</sub> 277	63	78	92	9.01	16.29
G	Bromus tectorum (a)	-	<sub>b</sub> 163	<sub>a</sub> 3	-	58	2	1.35	.03
G	Oryzopsis hymenoides	<sub>c</sub> 52	<sub>b</sub> 15	<sub>a</sub> -	22	9	-	.14	.00
G	Poa fendleriana	<sub>b</sub> 4	<sub>b</sub> 4	<sub>a</sub> -	3	3	-	.04	-
G	Poa secunda	<sub>a</sub> -	<sub>ab</sub> 3	<sub>b</sub> 9	-	2	3	.03	.04
G	Sitanion hystrix	<sub>b</sub> 28	<sub>a</sub> -	<sub>a</sub> 2	13	-	1	-	.03
G	Sporobolus cryptandrus	-	-	1	-	-	1	-	.03
G	Stipa comata	<sub>b</sub> 8	<sub>a</sub> -	<sub>ab</sub> 5	5	-	2	-	.03
G	Vulpia octoflora (a)	-	5	-	-	3	-	.01	-
Total for Annual Grasses		0	168	3	0	61	2	1.37	0.03
Total for Perennial Grasses		247	250	294	106	92	99	9.23	16.43
Total for Grasses		247	418	297	106	153	101	10.60	16.47
F	Agoseris glauca	-	-	-	-	-	-	.01	-
F	Allium spp.	-	3	-	-	1	-	.00	-
F	Astragalus convallarius	7	1	1	3	1	1	.01	.03
F	Astragalus spp.	-	6	1	-	3	1	.01	.00
F	Carduus nutans (a)	-	<sub>b</sub> 8	<sub>a</sub> -	-	3	-	.01	-
F	Cryptantha spp.	-	4	-	-	2	-	.01	-
F	Cymopterus spp.	<sub>a</sub> -	<sub>b</sub> 16	<sub>a</sub> -	-	8	-	.04	-
F	Descurainia spp. (a)	-	4	-	-	2	-	.01	-
F	Draba nemorosa (a)	-	<sub>b</sub> 96	<sub>a</sub> -	-	36	-	.21	-
F	Erodium cicutarium (a)	-	8	9	-	3	3	.16	.41
F	Erigeron pumilus	<sub>a</sub> 2	<sub>b</sub> 19	<sub>ab</sub> 13	1	8	6	.04	.05
F	Gilia hutchinifolia (a)	-	<sub>b</sub> 28	<sub>a</sub> -	-	13	-	.07	-
F	Haplopappus acaulis	3	7	3	2	2	1	.01	.00
F	Heterotheca villosa	<sub>a</sub> -	<sub>b</sub> 16	<sub>b</sub> 16	-	7	6	.21	.29
F	Lappula occidentalis (a)	-	<sub>b</sub> 43	<sub>a</sub> -	-	21	-	.15	-
F	Lactuca serriola	-	6	-	-	2	-	.15	-
F	Lepidium densiflorum (a)	-	<sub>b</sub> 24	<sub>a</sub> -	-	9	-	.19	-
F	Machaeranthera spp	<sub>a</sub> -	<sub>b</sub> 21	<sub>a</sub> -	-	9	-	.04	-
F	Medicago sativa	-	3	2	-	1	1	.00	.03
F	Penstemon spp.	-	1	3	-	1	1	.00	.15
F	Petradoria pumila	37	41	32	16	17	13	2.21	1.35
F	Phlox hoodii	28	32	13	14	14	7	.49	.11
F	Phlox longifolia	-	2	-	-	1	-	.00	-
F	Plantago patagonica (a)	-	3	-	-	1	-	.01	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
F	<i>Polygonum douglasii</i> (a)	-	3	-	-	1	-	.00	-
F	<i>Ranunculus testiculatus</i> (a)	-	3	-	-	2	-	.01	-
F	<i>Schoenocrambe linifolia</i>	a-	b17	a-	-	8	-	.07	-
F	<i>Sisymbrium altissimum</i> (a)	-	b27	a-	-	13	-	.07	-
F	<i>Sphaeralcea coccinea</i>	a-	b13	b12	-	6	5	.13	.05
F	<i>Streptanthus cordatus</i>	-	3	-	-	1	-	.00	-
F	<i>Tragopogon dubius</i>	b14	b5	a-	6	4	-	.02	-
Total for Annual Forbs		0	247	9	0	104	3	0.90	0.41
Total for Perennial Forbs		91	216	96	42	96	42	3.52	2.07
Total for Forbs		91	463	105	42	200	45	4.42	2.48

Values with different subscript letters are significantly different at  $\alpha = 0.10$  (annuals excluded)

#### BROWSE TRENDS --

Herd unit 13B, Study no: 7

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	<i>Artemisia nova</i>	0	1	-	-
B	<i>Artemisia tridentata</i> <i>wyomingensis</i>	0	1	-	.38
B	<i>Atriplex canescens</i>	1	1	-	.00
B	<i>Chrysothamnus nauseosus</i>	4	7	.98	1.62
B	<i>Ephedra viridis</i>	9	8	1.35	.86
B	<i>Gutierrezia sarothrae</i>	0	11	-	.02
B	<i>Juniperus osteosperma</i>	0	6	2.70	3.67
B	<i>Leptodactylon pungens</i>	4	4	.01	.18
B	<i>Opuntia</i> spp.	2	2	.03	.00
B	<i>Pinus edulis</i>	0	6	4.77	4.36
B	<i>Purshia tridentata</i>	1	1	.15	.30
Total for Browse		21	48	9.99	11.42

#### CANOPY COVER --

Herd unit 13B, Study no: 7

Species	Percent Cover
	'00
<i>Juniperus osteosperma</i>	5
<i>Pinus edulis</i>	4

BASIC COVER --

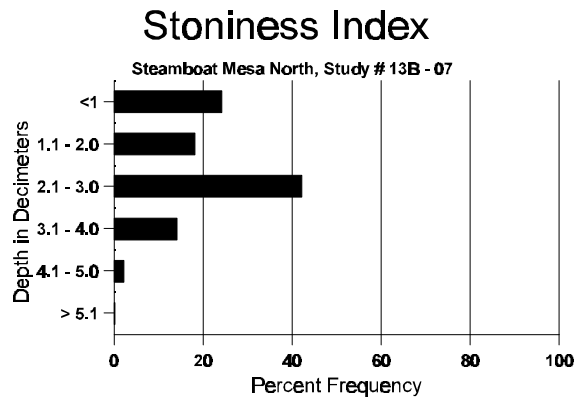
Herd unit 13B, Study no: 7

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'86	'95	'00
Vegetation	325	300	11.25	26.70	33.01
Rock	96	61	.25	4.64	6.08
Pavement	57	120	0	.13	2.52
Litter	383	356	65.00	37.74	47.32
Cryptogams	79	95	.25	.53	2.33
Bare Ground	299	296	23.25	33.34	38.60

SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 7, Study Name: Steamboat Mesa North

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
11.53	59.0 (12.44)	7.7	56.6	25.1	21.3	1.9	8.7	92.8	0.7



PELLET GROUP FREQUENCY --

Herd unit 13B, Study no: 7

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	18	32	513	N/A
Elk	1	-	-	-
Deer	19	9	63	42 (105)
Cattle	6	8	24	17 (43)

## BROWSE CHARACTERISTICS --

Herd unit 13B, Study no: 7

A Y G R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
	1	2	3	4	5	6	7	8	9	1	2	3	4		Ht. Cr.		
Amelanchier utahensis																	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	29	62	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	63	76	0
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>			
'86		00%				00%				00%							
'95		00%				00%				00%							
'00		00%				00%				00%							
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-		
												'95	0		-		
												'00	0		-		
Artemisia nova																	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	-	-	1	-	-	20	5	13	1
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>			
'86		00%				00%				00%							
'95		00%				00%				00%							
'00		00%				00%				00%							
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-		
												'95	0		-		
												'00	20		-		
Artemisia tridentata wyomingensis																	
M	86	1	-	-	-	-	-	-	-	-	1	-	-	66	22	19	1
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	9	14	0
	00	-	-	1	-	-	-	-	-	-	1	-	-	20	9	15	1
X	86	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>			
'86		00%				00%				00%							
'95		00%				00%				00%							
'00		00%				100%				00%							
Total Plants/Acre (excluding Dead & Seedlings)												'86	66	Dec:	-		
												'95	0		-		
												'00	20		-		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Atriplex canescens																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	1	-	-	-	-	-	-	-	-	-	-	20	38	41	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	34	79	0
D	86	1	-	-	-	-	-	-	-	-	-	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	1	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%			-70%							
'95		00%			100%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)													'86	66	Dec:	100%		
													'95	20		0%		
													'00	20		100%		
Chrysothamnus nauseosus																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	5	-	-	-	-	-	-	-	-	-	-	-	-	100	27	34	5
	00	4	1	-	-	-	-	-	-	1	-	-	-	-	120	37	45	6
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	1	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%			+29%							
'00		29%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)													'86	0	Dec:	0%		
													'95	100		0%		
													'00	140		14%		

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Ephedra viridis																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	7	-	-	2	-	-	-	-	-	-	-	-	-	180		9	
	00	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
M	86	-	-	2	-	-	-	-	-	-	2	-	-	-	133	18	11	2
	95	7	6	2	-	-	-	-	-	-	15	-	-	-	300	17	22	15
	00	-	-	9	4	-	-	-	-	-	13	-	-	-	260	21	29	13
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	2	-	-	1	-	-	3	-	-	-	60		3	
	00	-	-	3	-	3	-	-	-	-	5	-	-	1	120		6	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	60		3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			100%			00%			+75%							
'95		22%			07%			00%			-26%							
'00		15%			60%			05%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	133	Dec:	0%			
												'95	540		11%			
												'00	400		30%			
Gutierrezia sarothrae																		
S	86	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	15	0
	00	23	-	-	-	-	-	-	-	-	23	-	-	-	460	5	10	23
D	86	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	-	2	-	-	1	60		3	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	66	Dec:	100%			
												'95	0		0%			
												'00	560		11%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Juniperus osteosperma																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	86	1	-	-	-	-	-	-	-	-	1	-	-	-	66	83	58	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	00	2	-	-	-	-	-	-	3	-	5	-	-	-	100	-	-	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	66	Dec:	-			
												'95	0		-			
												'00	120		-			
Leptodactylon pungens																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80	5	10	
	00	6	-	-	-	-	-	-	-	-	6	-	-	-	120	5	10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%			+33%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	80		-			
												'00	120		-			
Opuntia spp.																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	5	18	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	4	10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	60		-			
												'00	60		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pinus edulis																		
Y	86	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	86	2	-	-	-	-	-	-	-	-	2	-	-	-	133	81 47	2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
	00	2	-	-	-	-	-	-	-	4	6	-	-	-	120	- -	6	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	333	Dec:	-			
												'95	0		-			
												'00	120		-			
Purshia tridentata																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	20 40	1	
	00	-	-	2	-	-	-	-	-	-	2	-	-	-	40	24 89	2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%			+50%							
'00		00%			100%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	20		-			
												'00	40		-			

Trend Study 13B-8-00

Study site name: Steamboat Mesa South.

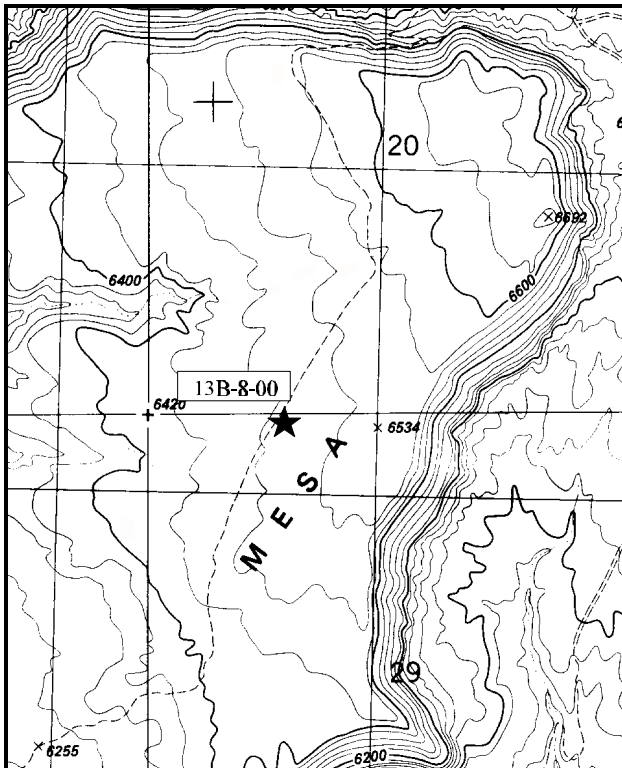
Range type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

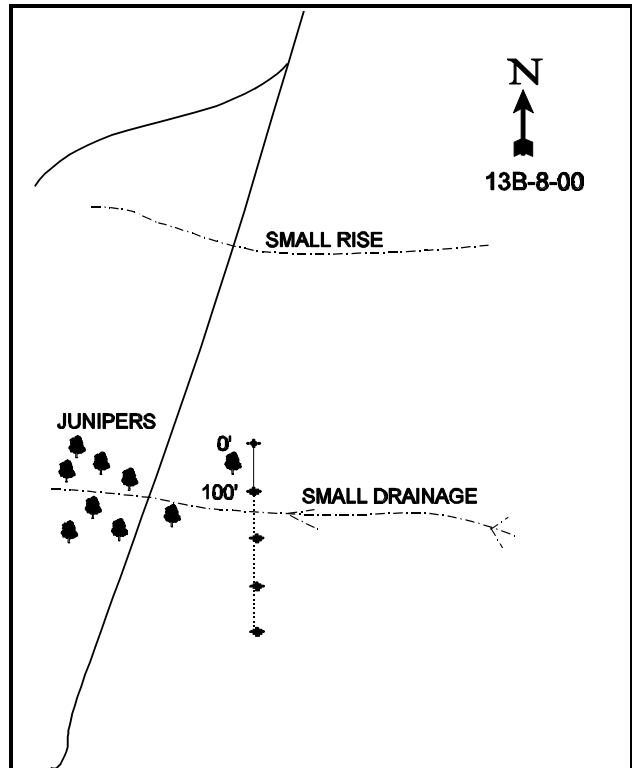
LOCATION DESCRIPTION

Start from site number 13B-7-00, Steamboat Mesa North. Continue south on the same road for 0.6 miles to a fork. Proceed straight 0.2 miles (halfway to an enclosure) to a large Juniper in a sagebrush-grass flat. The baseline 0-foot stake (tag #7812) is located north of the tree.



Map Name: Steamboat Mesa

Township 23S, Range 26E, Section 29



Diagrammatic Sketch

UTM 4294146.747 N, 666652.110 E

## DISCUSSION

### Trend Study No. 13B-8 (34-8)

Located approximately 3/4 miles south of transect 13B-7, the Steamboat Mesa South transect samples a habitat type dominated by native vegetation, although not in a completely natural condition. This open rolling site may be an example of a former sagebrush park undergoing a conversion to annual grass-sagebrush due to excessive livestock use in the past. A large exclosure is located to the south of the study. Two pellet group transects are also located on Steamboat Mesa. The lower elevation transect (6,300') shows an average of 27 deer days use/acre (67 ddu/ha) between 1986 and 1997. The pellet transect located at 6,700 feet, and closer to the this study, averaged 23 deer use days/acre (56 ddu/ha) for the same time period. A pellet group transect run parallel to the trend study baseline in 2000 estimates 86 deer days use/acre (212 ddu/ha) and 46 cow days use/acre (114 cdu/ha). All of the cattle and most of the deer use appears to be from the past winter ('99).

This area of the mesa is topographically an open park that slopes gently to the west with an elevation of 6,400 feet. The surface soil texture is a sandy clay loam with no rocks or pavement on the surface. Effective rooting depth is about 13 inches and soil reaction is neutral (pH 6.9). Low amounts of phosphorus (4.9ppm) and potassium (67.2ppm) could be a limiting factor for this site where 10ppm and 70ppm respectively are necessary for normal plant development and growth. As for all the other sites for this management unit, soil temperature is moderately high (62°F). Percent bare soil cover decreased from 1986 to 1995, now it has increased to over 40% with the exceptionally dry year in 2000. Vegetative cover and litter cover have both decreased. This helps illustrate the point that you cannot depend on annuals to provide consistent litter cover year to year.

Wyoming big sagebrush, the key browse species, currently ('00) has an estimated density of 2,480 plants/acre. The population appears vigorous with moderate to heavy use reported in 1986, mostly light use in 1995 and heavy use in 2000. Age class distribution is fairly stable with nearly the same proportion of young and mature with each reading. Only 2% of the population is decadent. Winterfat was also sampled on this site, but is in very low numbers, vigorous, and with no signs of utilization. Escape and thermal cover is found in scattered junipers along washes and ridgetops. Most of the trees have been highlined.

Cheatgrass was the most abundant grass accounting for 53% of the total vegetative cover in 1995 and was found in 95% of the quadrats. Currently ('00) this has turned completely around with cheatgrass only making up 11% of the total vegetative cover and quadrat frequency has gone down to 64%. The cheatgrass will provide some early spring forage, however now it does not pose a severe fire hazard as it did previously. Both needle and thread grass and mutton bluegrass significantly decreased in nested frequency between 1986 to 1995. In 2000, with the dry year and corresponding reduction in competition from cheatgrass, needle and thread grass has increased from less than 1% to more than 16% cover and quadrat frequency has risen sharply from 40% to 93%. It now provides 69% of the total herbaceous cover an increase from 3% in 1995. Galleta has remained stable while Indian ricegrass has decreased slightly. They still occur in relatively low densities. Forbs comprise 21% of the vegetative cover with nearly two-thirds being annual species in 1995. Currently annuals only make up 4% of the vegetative cover. Perennial forbs have also declined in frequency and cover since 1995. This illustrates the effect the dry year has had on forbs. Most of these forbs are small and not of much value for winter forage.

### 1986 APPARENT TREND ASSESSMENT

The soil appears stable with no signs of erosion on the study site. The vegetative trend appears generally stable in terms of succession, except for form and vigor of Wyoming big sagebrush. In the past there had been signs of sagebrush that had died, most likely from overuse and/or prolonged drought. A series of winters with constant snow cover and use by cattle could be very detrimental to the sagebrush population. Currently, the sagebrush appears healthy, but the stand density is low.

## 1995 TREND ASSESSMENT

The soil is adequately covered by both vegetation and litter. Both adequate ground cover and no signs of erosion indicate a stable soil trend. Grass cover is good, but most comes from undesirable annual species. Cheatgrass is abundant and contributes large quantities of fine fuel to the litter. Furthermore, 70% of the total herbaceous understory cover is contributed by annual species. Most forbs have little forage value, but do aid in soil stabilization. Because cheatgrass dominates the site, there is a high probability of losing the sagebrush population with a single wildfire event. The herbaceous understory trend for this site is considered downward because of the high percentage of annual species. Wyoming big sagebrush shows less utilization than in the past, exhibiting characteristics of a stable population. It has a good biotic potential of 10% and the young age class is at 46%. The winterfat population is also stable with no observable utilization. Thus, browse trend is considered stable.

### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - downward (1) because of the high percentage of annual species

## 2000 TREND ASSESSMENT

Percent bare soil has increased sharply since 1995 with it increasing from 15% to 44% with significant decreases in vegetative and litter cover. The ratio of bare soil to protective cover has also deteriorated downward from 1:3.5 to 1:2.3, also indicating a downward trend. In 1995 annuals contributed to 70% of the vegetative cover, where currently they only make up 13% of the vegetative cover. Another clear example of why annual vegetative and litter cover is not an adequate or dependable source of protective cover for the soil. The trend for soil is slightly downward. Grass cover is good, with most of it coming from perennial species. The forbs have little forage value and only make up 4% of the vegetative cover. Cheatgrass does not currently dominate the site, therefore it is not a high fire hazard as it was in 1995. The herbaceous understory trend for this site is considered improving because of the increased values for perennial species and the decrease in the abundance of annual species. Wyoming big sagebrush shows continued moderate to heavy use, but it still exhibits characteristics of a stable healthy population. It has a fair to good biotic potential and the young age class makes up 50% of the population. The winterfat population is also stable with no observable utilization. Thus, browse trend is considered stable.

### TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - improving (4) because of the decrease of annual species and increase in perennial species

HERBACEOUS TRENDS --  
Herd unit 13B, Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
G	Agropyron cristatum	a <sup>-</sup>	b <sup>7</sup>	a <sup>-</sup>	-	3	-	.01	-
G	Bromus tectorum (a)	-	b <sup>341</sup>	a <sup>181</sup>	-	95	64	15.05	3.09
G	Hilaria jamesii	a <sup>17</sup>	b <sup>52</sup>	b <sup>52</sup>	7	22	21	.79	1.58
G	Oryzopsis hymenoides	6	20	7	2	7	3	.77	.21
G	Poa fendleriana	26	16	5	10	6	3	.05	.16
G	Poa secunda	a <sup>-</sup>	c <sup>117</sup>	b <sup>54</sup>	-	46	21	.65	.52
G	Sitanion hystrix	11	-	-	7	-	-	-	-
G	Sporobolus cryptandrus	b <sup>7</sup>	a <sup>-</sup>	c <sup>19</sup>	3	-	10	-	.81
G	Stipa comata	b <sup>257</sup>	a <sup>91</sup>	b <sup>260</sup>	90	40	93	.70	16.47
G	Vulpia octoflora (a)	-	b <sup>231</sup>	a <sup>6</sup>	-	70	3	1.08	.01
Total for Annual Grasses		0	572	187	0	165	67	16.14	3.11
Total for Perennial Grasses		324	303	397	119	124	151	2.99	19.77
Total for Grasses		324	875	584	119	289	218	19.14	22.88
F	Astragalus spp.	a <sup>-</sup>	b <sup>29</sup>	a <sup>-</sup>	-	15	-	.24	-
F	Carduus nutans (a)	-	b <sup>59</sup>	a <sup>-</sup>	-	28	-	.14	-
F	Cymopterus spp.	-	6	-	-	2	-	.01	-
F	Draba nemorosa (a)	-	a <sup>15</sup>	b <sup>51</sup>	-	5	22	.02	.16
F	Erodium cicutarium (a)	-	a <sup>-</sup>	b <sup>16</sup>	-	-	6	-	.03
F	Erigeron pumilus	a <sup>-</sup>	a <sup>-</sup>	b <sup>11</sup>	-	-	5	.00	.02
F	Gilia hutchinifolia (a)	-	b <sup>32</sup>	a <sup>2</sup>	-	16	1	.08	.00
F	Grindelia squarrosa	-	1	-	-	1	-	.00	-
F	Hedysarum spp.	-	6	-	-	2	-	.18	-
F	Lappula occidentalis (a)	-	b <sup>16</sup>	a <sup>-</sup>	-	7	-	.06	-
F	Lactuca serriola	a <sup>-</sup>	b <sup>30</sup>	a <sup>-</sup>	-	16	-	.08	-
F	Lepidium densiflorum (a)	-	b <sup>201</sup>	a <sup>-</sup>	-	68	-	.95	-
F	Leucelene ericoides	a <sup>-</sup>	b <sup>9</sup>	b <sup>10</sup>	-	4	3	.16	.33
F	Machaeranthera spp	a <sup>-</sup>	b <sup>10</sup>	a <sup>-</sup>	-	6	-	.03	-
F	Phlox hoodii	-	4	-	-	1	-	.03	-
F	Phlox longifolia	-	4	-	-	2	-	.01	-
F	Plantago patagonica (a)	-	b <sup>232</sup>	a <sup>64</sup>	-	67	25	2.34	.22
F	Polygonum douglasii (a)	-	2	-	-	1	-	.00	-
F	Ranunculus testiculatus (a)	-	3	-	-	1	-	.00	-
F	Schoenocrambe linifolia	a <sup>-</sup>	b <sup>35</sup>	a <sup>-</sup>	-	16	-	.08	-
F	Sisymbrium altissimum (a)	-	b <sup>50</sup>	a <sup>-</sup>	-	25	-	.18	-
F	Sphaeralcea coccinea	c <sup>207</sup>	b <sup>108</sup>	a <sup>45</sup>	79	39	23	1.09	.34
F	Tragopogon dubius	c <sup>69</sup>	b <sup>21</sup>	-	29	11	-	.05	-

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
F	Trifolium spp.	-	2	-	-	1	-	.00	-
F	Unknown forb-perennial	<sub>b</sub> 15	<sub>b</sub> 24	<sub>a</sub> -	6	8	-	.06	-
Total for Annual Forbs		0	610	133	0	218	54	3.80	0.41
Total for Perennial Forbs		291	289	66	114	124	31	2.05	0.69
Total for Forbs		291	899	199	114	342	85	5.86	1.11

Values with different subscript letters are significantly different at  $\alpha = 0.10$  (annuals excluded)

#### BROWSE TRENDS --

Herd unit 13B, Study no: 8

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	40	45	1.53	2.34
B	Ceratoides lanata	2	2	-	-
B	Opuntia spp.	0	1	-	-
B	Pinus edulis	0	1	1.82	.98
Total for Browse		42	49	3.36	3.32

#### CANOPY COVER --

Herd unit 13B, Study no: 8

Species	Percent Cover
	'00
Juniperus osteosperma	3
Pinus edulis	1

#### BASIC COVER --

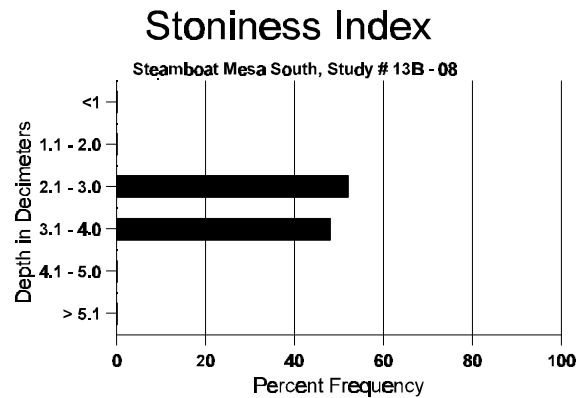
Herd unit 13B, Study no: 8

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'86	'95	'00
Vegetation	393	331	6.00	44.37	29.38
Rock	-	-	0	0	0
Pavement	-	-	0	0	0
Litter	400	369	67.00	60.84	51.45
Cryptogams	163	42	0	1.98	.86
Bare Ground	274	318	27.00	14.81	43.76

# SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 8, Study Name: Steamboat Mesa South

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	% OM	PPM P	PPM K	dS/m
13.01	62.4 (14.57)	6.9	54.6	23.1	25.3	1.4	4.9	67.2	0.5



# PELLET GROUP FREQUENCY --

Herd unit 13B, Study no: 8

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	5	41	174	N/A
Deer	18	33	1114	86 (212)
Cattle	21	17	548	46 (113)

## BROWSE CHARACTERISTICS --

Herd unit 13B, Study no: 8

Artemisia tridentata wyomingensis																		
A Y G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
S	86	1	1	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	86	5	9	3	1	-	-	-	-	-	18	-	-	-	1200		18	
	95	37	-	-	-	-	-	-	-	-	37	-	-	-	740		37	
	00	25	16	20	1	-	-	-	-	-	62	-	-	-	1240		62	
M	86	-	7	9	-	-	-	-	-	-	16	-	-	-	1066	17 12	16	
	95	19	22	1	-	-	-	-	-	-	42	-	-	-	840	17 25	42	
	00	7	18	34	-	-	-	-	-	-	59	-	-	-	1180	14 21	59	
D	86	-	-	1	-	-	-	-	-	-	1	-	-	-	66		1	
	95	2	-	-	-	-	-	-	-	-	-	-	-	2	40		2	
	00	1	1	1	-	-	-	-	-	-	1	-	-	2	60		3	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		46%			37%			00%			-31%							
'95		27%			01%			02%			+35%							
'00		28%			44%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	2332	Dec:	3%			
												'95	1620		2%			
												'00	2480		2%			
Ceratoides lanata																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	86	-	-	1	-	-	-	-	-	-	1	-	-	-	66	14 11	1	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	11 16	1	
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100	14 15	5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			100%			00%			- 9%							
'95		00%			00%			00%			+40%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	66	Dec:	-			
												'95	60		-			
												'00	100		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus nauseosus																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	19	28	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Gutierrezia sarothrae																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Opuntia spp.																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	20		-			
Pinus edulis																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	20		-			

### Trend Study 13B-9-00

Study site name: Steamboat East Bench.

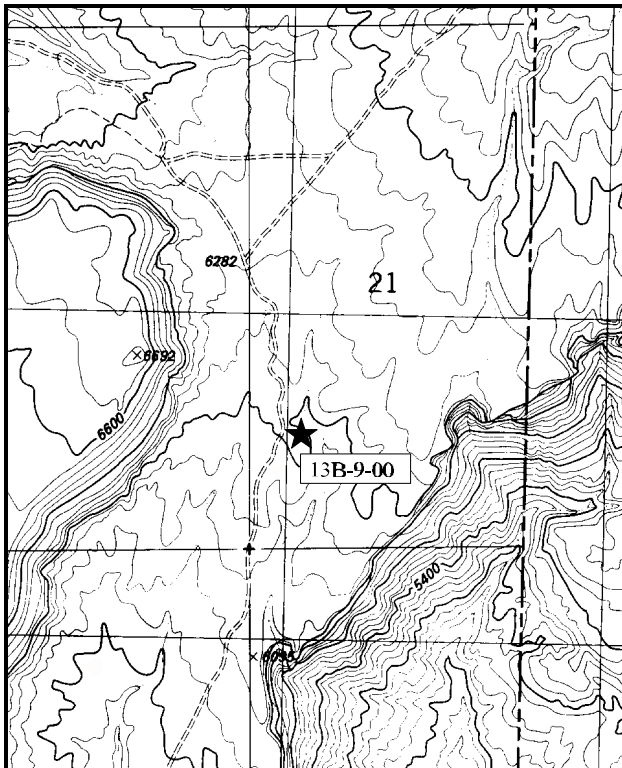
Range type: Chained. Seeded P-J.

Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

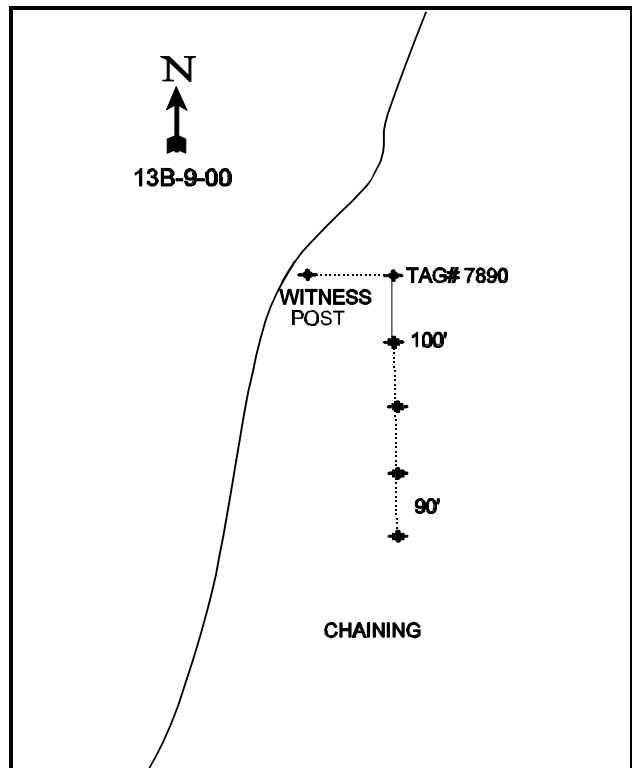
### LOCATION DESCRIPTION

From the Buckhorn Draw transect (13B-5). Continue southeast for 1.35 miles to the "Granary" intersection. Turn right and go 0.2 miles to a fork. Stay left. Go 1.55 miles and turn left. Go down this road 0.7 miles to Granite Creek. Cross the creek and proceed 4.8 miles to a fork. Stay left, then right at another fork which connects back to the main road, traveling 0.4 miles to a stock pond. Continue 0.15 miles to a fork with many branches (the right goes up on Steamboat Mesa). Stay on the same road (straight through the intersection and up a steep hill) for 0.5 miles to an old P-J chaining and a 2 ½ foot tall rebar witness post on the left, 6 feet off the road. The 0-foot end of the baseline is 100 feet east of the witness post and is marked by a rebar tagged #7890.



Map Name: Steamboat Mesa

Township 23S, Range 26E, Section 21



Diagrammatic Sketch

UTM 4294656.310 N, 668020.850 E

## DISCUSSION

### Trend Study No. 13B-9 (34-9)

The Steamboat East Bench transect is located on a narrow bench (one-half mile wide) below Steamboat Mesa, bounded on the west by the sheer sandstone cliffs of Steamboat Mesa and on the east by deep canyons of the Dolores River. The northern part of the bench was included in the 1968 Steamboat Mesa allotment chaining. Currently, the area supports a moderately dense stand of pinyon-juniper and a variety of shrubs and herbaceous plants. The study site is on a moderately sloping ridge with a west-southwest exposure and an elevation of 6,200 feet. Drainage off the bench is to the south. A pellet group transect run parallel to the trend study baseline in 2000 estimates 17 deer days use/acre (42 ddu/ha) and 7 elk days use/acre (17 edu/ha).

The soil texture is a sandy clay loam with an effective rooting depth of about 12 inches. The soil temperature is moderately high (63° F). One limiting factor could be low amounts of phosphorus (2ppm) where 10ppm is considered minimal for normal plant growth and development. Erosion is evident in areas disturbed by roads. Overall the vegetative and litter cover provides adequate soil protection. Some slight pedestalling of some plants and large rocks was noted in the interspaces.

The site supports a variety of browse species. Preferred species include: Utah serviceberry, black sagebrush, Wyoming big sagebrush, true mountain mahogany and green ephedra. These species provided 22% of the browse cover in 1995 and 17% in 2000. Most of these key browse species occur in low to very low densities. For example, true mountain mahogany provides the most forage (contributes 16% and 12% of the total browse cover respectively for 1995 and 2000) even though it has a relatively low density of only 120 plants/acre in 2000. Mature plants are large, averaging over 6 feet in height making them partly unavailable to browsing. Use was mostly light in 1995 and 2000.

Black sagebrush has an estimated density of 440 plants/acre ('95 and '00), but only provides 4% of the total browse cover during the last two sampling dates. It showed moderate to heavy hedging in 1986 and 1995 but light use in 2000. It displays good vigor and low decadency. The proportion of young plants was relatively stable except for this last year with few to no seedlings present. Wyoming big sagebrush was also sampled at a low density of only 132 plants/acre in 1986 declining to only 40 in 2000. The scattered Utah serviceberry was not encountered in the shrub density strips in 2000. Some surrounding mature plants measured for height/crown are large averaging 9 feet tall with a crown measurement of 14 feet. Pinyon and juniper trees dominate the site. They currently ('00) provide 76% of the browse cover with a density of 274 pinyon trees/acre and 63 Utah juniper trees/acre using point-center quarter data.

On average, grasses contribute 24% of the total vegetative cover on this site. It is an important component in stabilizing the soil. Cheatgrass was the most abundant grass in 1995, contributing almost half of the total grass cover. Currently ('00) it only makes up 1% of the grass cover due to the dry season. Crested wheatgrass was second in abundance in 1995. With the decrease in cheatgrass competition, it has now increased from 31% to 66% of the grass cover. Both Indian ricegrass and bottlebrush squirreltail have continued to decreased in abundance. Forbs provide little forage or ground cover with most occurring as low growing life forms. Stemless goldenweed and rock goldenrod are the most abundant forbs on the site. Other common forbs include: hairy goldaster, tumble mustard, and Hood's phlox.

### 1986 APPARENT TREND ASSESSMENT

Currently, browse density and diversity is promising on this winter range. However, many of the more palatable shrubs have been heavily hedged and may be receiving too much pressure to continue in the community. The most obvious downward trend indicator is the gradual increase of the pinyon-juniper trees. Many of the pinyon

are suffering from an unidentified disease (or possibly an herbicide), therefore their increase is difficult to predict and will be interesting to follow the changes taking place. Other trend parameters such as form, vigor, and age class distribution for key species appear stable. The overall soil trend also appears stable.

### 1995 TREND ASSESSMENT

Bare ground has decreased since 1986 with only slight sign of erosion. Vegetation and litter offer good protection and contribute to a stable soil trend. The herbaceous understory is comprised primarily of grasses. This includes two annual and six perennial species, of which, cover is almost equally distributed (annuals 47% vs 53% perennial). Herbaceous understory is stable, although a better composition is desired. The pinyon and juniper extensive root system may be affecting the understory species by being more competitive for moisture. There are several different browse species, of which, broom snakeweed is the most abundant. This population does not appear to be expanding at this time, but are becoming slightly more robust. Both sagebrush populations show a decrease in percent decadency with a few plants being heavily hedged. Almost 1 out of 4 black sagebrush and 1 out of 3 Wyoming big sagebrush are dead at this time. This is most likely due to extended drought conditions, thinning out the sagebrush populations and competition with the pinyon and juniper trees. Although these are relatively high ratio's, there is still a comparatively high percentage of young plants in the population. This combined with light use of other palatable browse species, contributes to a stable to slightly upward browse trend.

#### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3) but poor composition with too many annuals

### 2000 TREND ASSESSMENT

Percent bare soil has increased slightly since 1995 with only almost no sign of erosion. There has been increases in both vegetation and litter cover. The ratio of bare soil to protective cover has increased from 1:2.1 to 1:2.6 which provides good protection and contributes to a stable soil trend. The herbaceous understory is comprised primarily of grasses. This includes mostly perennial species (crested wheatgrass, purple three-awn, galleta, and Indian ricegrass) which makes up more than 98% of the grass cover. At this time annuals only make up 1% of the grass cover. Herbaceous understory is stable even though there was a slight decrease in sum of nested frequency for perennial grasses. However, there is a much improved composition of mostly perennials at this time. The pinyon and juniper extensive root system is affecting the understory species by being more competitive for moisture and sunlight. This is especially true for this last year of extreme drought. There are several different browse species, of which, broom snakeweed is still the most abundant browse. This population does not appear to be expanding at this time as its density is down slightly from 1995. Both sagebrush populations continue to show a decrease in percent decadency (0% in 2000). Black sagebrush and Wyoming big sagebrush are a minor component as together they only make up 5% of the browse cover. With a pinyon-juniper density of 337 trees/acre, the preferred browse will never be an important winter forage component until the competitive tree overstory is thinned. Seventy-six percent of the total browse cover comes from pinyon and juniper trees making it difficult for any browse species to do well in this community. Browse trend is slightly down.

#### TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - stable with a great reduction of annuals (3)

HERBACEOUS TRENDS --  
Herd unit 13B, Study no: 9

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
G	Agropyron cristatum	<sub>a</sub> 63	<sub>b</sub> 106	96	26	38	38	2.00	5.21
G	Aristida purpurea	<sub>a</sub> -	<sub>b</sub> 16	<sub>b</sub> 13	-	7	5	.40	.84
G	Bromus tectorum (a)	-	<sub>b</sub> 243	<sub>a</sub> 6	-	79	4	3.00	.09
G	Hilaria jamesii	<sub>a</sub> -	<sub>b</sub> 14	<sub>b</sub> 18	-	4	6	.48	1.01
G	Oryzopsis hymenoides	<sub>b</sub> 29	<sub>a</sub> 17	<sub>a</sub> 11	21	9	8	.46	.68
G	Poa fendleriana	<sub>b</sub> 15	<sub>b</sub> 15	<sub>a</sub> -	7	7	-	.03	-
G	Poa secunda	-	-	2	-	-	1	-	.00
G	Sitanion hystrix	<sub>b</sub> 62	<sub>a</sub> 7	<sub>a</sub> 4	29	3	2	.04	.04
G	Vulpia octoflora (a)	-	4	-	-	2	-	.01	-
Total for Annual Grasses		0	247	6	0	81	4	3.01	0.09
Total for Perennial Grasses		169	175	144	83	68	60	3.43	7.80
Total for Grasses		169	422	150	83	149	64	6.45	7.89
F	Arabis drummondi	<sub>a</sub> -	<sub>b</sub> 9	<sub>a</sub> -	-	4	-	.02	-
F	Astragalus mollissimus	<sub>b</sub> 15	<sub>b</sub> 10	<sub>a</sub> -	7	4	-	.05	-
F	Astragalus spp.	-	4	-	-	2	-	.01	-
F	Carduus nutans (a)	-	<sub>b</sub> 5	<sub>a</sub> -	-	3	-	.01	-
F	Cryptantha spp.	<sub>a</sub> -	<sub>b</sub> 23	<sub>a</sub> -	-	13	-	.06	-
F	Cymopterus spp.	<sub>a</sub> -	<sub>b</sub> 16	<sub>a</sub> -	-	8	-	.04	-
F	Draba nemorosa (a)	-	4	-	-	2	-	.01	-
F	Erodium cicutarium (a)	-	<sub>b</sub> 18	<sub>a</sub> 5	-	8	2	.04	.01
F	Erigeron pumilus	2	-	-	2	-	-	-	-
F	Euphorbia spp.	<sub>c</sub> 13	<sub>b</sub> 4	<sub>a</sub> -	9	3	-	.01	-
F	Gilia hutchinifolia (a)	-	<sub>b</sub> 28	<sub>a</sub> -	-	16	-	.08	-
F	Haplopappus acaulis	<sub>b</sub> 70	<sub>a</sub> 31	<sub>a</sub> 29	31	15	14	.39	.24
F	Heterotheca villosa	<sub>a</sub> -	<sub>b</sub> 12	<sub>ab</sub> 4	-	4	2	.16	.15
F	Hymenoxys acaulis	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 5	-	-	3	-	.06
F	Lappula occidentalis (a)	-	2	-	-	1	-	.00	-
F	Lactuca serriola	-	1	-	-	1	-	.00	-
F	Lesquerella ludoviciana	<sub>b</sub> 10	<sub>a</sub> -	<sub>a</sub> -	4	-	-	-	-
F	Lithospermum spp.	-	2	-	-	1	-	.00	-
F	Machaeranthera grindelioides	<sub>b</sub> 10	<sub>a</sub> -	<sub>a</sub> -	4	-	-	-	-
F	Medicago sativa	-	-	-	-	-	-	.01	-
F	Penstemon carnosus	<sub>ab</sub> 3	<sub>b</sub> 5	<sub>a</sub> -	1	3	-	.04	-
F	Petradoria pumila	<sub>b</sub> 28	<sub>a</sub> 14	<sub>ab</sub> 16	14	6	6	.47	1.12
F	Phlox hoodii	<sub>b</sub> 25	<sub>a</sub> 11	<sub>a</sub> 10	10	4	5	.05	.07
F	Physaria spp.	1	-	-	1	-	-	-	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'95	'00	'86	'95	'00	'95	'00
F	Sisymbrium altissimum (a)	<sub>a</sub> 1	<sub>b</sub> 13	<sub>a</sub> -	1	6	-	.03	-
F	Silene spp.	<sub>a</sub> -	<sub>b</sub> 11	<sub>a</sub> -	-	4	-	.02	-
F	Streptanthus cordatus	<sub>a</sub> -	<sub>b</sub> 7	<sub>a</sub> -	-	4	-	.02	-
F	Townsendia incana	3	-	-	1	-	-	-	-
F	Tragopogon dubius	<sub>b</sub> 17	<sub>a</sub> 3	<sub>a</sub> -	7	1	-	.00	-
Total for Annual Forbs		1	70	5	1	36	2	0.17	0.00
Total for Perennial Forbs		197	163	64	91	77	30	1.39	1.66
Total for Forbs		198	233	69	92	113	32	1.57	1.67

Values with different subscript letters are significantly different at  $\alpha = 0.10$  (annuals excluded)

#### BROWSE TRENDS --

Herd unit 13B, Study no: 9

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier utahensis	1	0	-	-
B	Artemisia nova	13	13	.85	1.00
B	Artemisia tridentata wyomingensis	5	1	.18	.15
B	Cercocarpus montanus	10	5	3.25	2.76
B	Ephedra viridis	1	1	.15	.15
B	Gutierrezia sarothrae	30	32	.71	1.28
B	Juniperus osteosperma	0	7	2.95	5.73
B	Opuntia spp.	1	2	-	.03
B	Pinus edulis	0	16	11.50	12.08
B	Sclerocactus	1	5	.00	.06
B	Symphoricarpos oreophilus	1	1	.15	.15
B	Yucca harrimaniae	1	2	.00	.00
Total for Browse		64	85	19.75	23.42

#### CANOPY COVER --

Herd unit 13B, Study no: 9

Species	Percent Cover '00
Juniperus osteosperma	9
Pinus edulis	12

BASIC COVER --

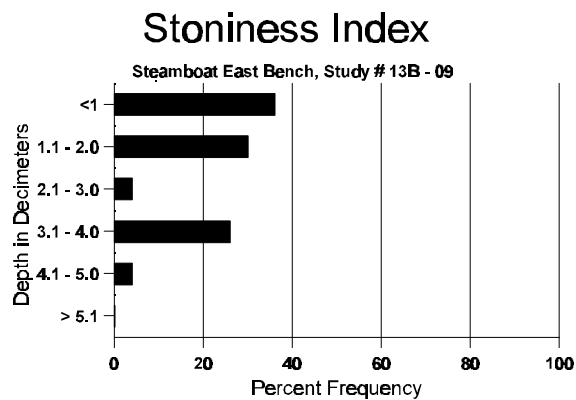
Herd unit 13B, Study no: 9

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'86	'95	'00
Vegetation	316	216	2.00	27.71	32.60
Rock	236	182	7.00	15.66	11.94
Pavement	65	176	1.75	.52	6.53
Litter	382	356	55.50	41.47	50.87
Cryptogams	62	60	1.00	.80	1.73
Bare Ground	264	239	32.75	26.00	28.85

SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 9, Study Name: Steamboat East Bench

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
11.72	63.4 (13.15)	7.3	57.6	17.1	25.2	2.0	2.0	80.0	0.6



PELLET GROUP FREQUENCY --

Herd unit 13B, Study no: 9

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	17	15	418	N/A
Elk	9	-	11	7 (19)
Deer	6	10	218	17 (42)
Cattle	-	1	-	-

## BROWSE CHARACTERISTICS --

Herd unit 13B, Study no: 9

Treatment Unit 15B, Study No. 2																		
A Y G R E	Form Class (No. of Plants)										Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier utahensis																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	40			2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	1	-	-	-	-	-	1	-	-	20			1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0	119	169	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0	109	167	0	
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'86		00%				00%				00%								
'95		00%				00%				00%								
'00		00%				00%				00%								
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	20		-			
												'00	0		-			
Artemisia nova																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	40			2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
Y	86	5	6	-	-	-	-	-	-	-	11	-	-	366			11	
	95	2	4	-	-	-	-	-	-	-	6	-	-	120			6	
	00	1	-	-	-	-	-	-	-	-	1	-	-	20			1	
M	86	8	4	1	-	-	-	-	-	-	13	-	-	433	8	11	13	
	95	3	8	4	-	-	-	-	-	-	15	-	-	300	10	18	15	
	00	20	1	-	-	-	-	-	-	-	21	-	-	420	7	17	21	
D	86	3	8	1	-	-	-	-	-	-	10	-	-	400			12	
	95	1	-	-	-	-	-	-	-	-	1	-	-	20			1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	120			6	
	00	-	-	-	-	-	-	-	-	-	-	-	-	180			9	
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'86		50%				06%				06%				-63%				
'95		55%				18%				00%				+ 0%				
'00		05%				00%				00%								
Total Plants/Acre (excluding Dead & Seedlings)												'86	1199	Dec:	33%			
												'95	440		5%			
												'00	440		0%			

Age	Y R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata wyomingensis																		
Y	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	86	-	1	-	-	-	-	-	-	-	1	-	-	-	33	5	7	
	95	1	-	2	-	-	-	-	-	-	3	-	-	-	60	14	22	
	00	-	-	2	-	-	-	-	-	-	2	-	-	-	40	9	17	
D	86	-	1	1	-	-	-	-	-	-	1	-	-	1	66		2	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		50%			25%			25%			- 9%							
'95		00%			33%			00%			-67%							
'00		00%			100%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	132	Dec:	50%			
												'95	120		33%			
												'00	40		0%			
Cercocarpus montanus																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	5	-	-	1	-	-	-	-	-	6	-	-	-	120		6	
	00	-	-	-	1	-	-	1	-	-	2	-	-	-	40		2	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	2	1	-	2	-	-	-	-	-	5	-	-	-	100	68	94	
	00	-	-	-	-	1	-	2	-	-	3	-	-	-	60	74	92	
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	1	20		1	
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		08%			00%			08%			-50%							
'00		17%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	0%			
												'95	240		8%			
												'00	120		17%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysanthamnus nauseosus hololeucus																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	43	56	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Ephedra viridis																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	34	35	1
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	33	57	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	20		-			
												'00	20		-			
Gutierrezia sarothrae																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	13	-	-	-	-	-	-	-	-	13	-	-	-	260			13
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	86	7	-	-	-	-	-	-	-	-	7	-	-	-	233			7
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	86	39	-	-	-	-	-	-	-	-	39	-	-	-	1300	8	10	39
	95	74	-	-	-	-	-	-	-	-	74	-	-	-	1480	9	13	74
	00	43	-	-	1	-	-	-	-	-	41	-	3	-	880	6	11	44
D	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	95	3	-	-	-	-	-	-	-	-	2	-	-	1	60			3
	00	19	-	-	-	-	-	-	-	-	3	-	1	15	380			19
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	560			28
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%			+ 7%							
'95		00%			00%			01%			-23%							
'00		00%			00%			29%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	1566	Dec:	2%			
												'95	1680		4%			
												'00	1300		29%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Juniperus osteosperma																		
S	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	2	-	-	1	-	-	-	3	-	6	-	-	-	120	-	6	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'86	0	Dec:	-	
														'95	0		-	
														'00	140		-	
Opuntia spp.																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	3	11	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	3	12	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'86	0	Dec:	-	
														'95	20		-	
														'00	40		-	

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pinus edulis																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
Y	86	3	-	-	-	-	-	-	-	-	3	-	-	-	100		3	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	5	-	-	7	-	-	-	-	-	12	-	-	-	240		12	
M	86	6	-	-	-	-	-	-	-	-	3	3	-	-	200	81	39	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	00	3	-	-	-	-	-	5	3	-	11	-	-	-	220	-	-	
D	86	1	-	-	-	-	-	-	-	-	-	-	-	1	33		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			10%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	333	Dec:	10%			
												'95	0		0%			
												'00	460		0%			
Sclerocactus																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	11	8	
	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160	5	7	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%			+75%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	40		-			
												'00	160		-			
Symphoricarpos oreophilus																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20	30	57	
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20	-	-	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			00%										
'95		00%			00%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	0	Dec:	-			
												'95	20		-			
												'00	20		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Yucca harrimaniae																		
Y	86	7	-	-	-	-	-	-	-	-	7	-	-	-	233		7	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	86	17	-	-	-	-	-	-	-	-	17	-	-	-	566	12	16	
	95	1	-	-	-	-	-	-	-	-	-	-	-	-	20	4	2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	12	13	
D	86	1	-	-	-	-	-	-	-	-	-	-	-	1	33		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		00%			00%			04%			-98%							
'95		00%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	832	Dec:	4%			
												'95	20		0%			
												'00	40		0%			

## SUMMARY

### WILDLIFE MANAGEMENT UNIT - 13 B (34) - DOLORES TRIANGLE

Four of the 9 studies located in the Dolores Triangle unit sample pinyon-juniper chainings completed in 1968. The chaining sites include Fish Park (#3), Ryan Park (#6), Steamboat Mesa North (#7), and Steamboat East Bench (#9). Another four sites are considered sagebrush/grass sites. These sites include Lower Westwater (#1), Upper Westwater (#2), Buckhorn Draw (#5), and Steamboat Mesa South (#8). The final site, Red Cliffs (#4), is classified as a blackbrush site. The following table summarizes trends for all sites for all years. Detailed information with regard to site trends is written up in each site narrative. The exceptionally dry year has greatly reduced the dominance of cheatgrass and decreased the amount of forbs throughout this unit.

#### TREND SUMMARY

Site No. and Name	Category	1986	1995	2000
13B-1 Lower Westwater	soil	est	3	2
	browse	est	1	1
	herbaceous understory	est	1	1
13B-2 Upper Westwater	soil	est	3	1
	browse	est	1	1
	herbaceous understory	est	1	1
13B-3 Fish Park	soil	est	3	3
	browse	est	5	3
	herbaceous understory	est	2	3
13B-4 Red Cliffs	soil	est	3	3
	browse	est	3	3
	herbaceous understory	est	2	3
13B-5 Buckhorn Draw	soil	est	3	2
	browse	est	4	3
	herbaceous understory	est	3	3
13B-6 Ryan Creek	soil	est	3	2
	browse	est	1	3
	herbaceous understory	est	1	3
13B-7 Steamboat Mesa North	soil	est	3	3
	browse	est	3	3
	herbaceous understory	est	4	4

est = established, 1 = down, 2 = slightly down, 3 = stable, 4 = slightly up, 5 = up

Site No. and Name	Category	1986	1995	2000
13B-8 Steamboat Mesa South	soil	est	3	2
	browse	est	3	3
	herbaceous understory	est	1	4
13B-9 Steamboat Mesa East Bench	soil	est	3	3
	browse	est	3	2
	herbaceous understory	est	3	3

est = established, 1 = down, 2 = slightly down, 3 = stable, 4 = slightly up, 5 = up